Guide 70

EUB

Drilling Waste Disposal Inspection Manual

February 2002

Alberta Energy and Utilities Board

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ALBERTA ENERGY AND UTILITIES BOARD
Guide 70: Drilling Waste Disposal Inspection Manual

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1 Overview

1.1 Purpose of the Guide

This guide and inspection forms are designed to ensure that drilling waste disposal inspections are carried out in a uniform, consistent manner. They are also intended to inform industry well licensee personnel as to exactly what is required to achieve a satisfactory Alberta Energy and Utilities Board (EUB) drilling waste disposal inspection.

The EUB reviews drilling waste disposal notifications and inspects operations to ensure adherence to the requirements of *Guide 50: Drilling Waste Management*. To assist in the evaluation of selected disposal operations, the Drilling Waste Disposal Inspection Form—Routine and Drilling Waste Disposal Inspection Form—Nonroutine have been developed. EUB Field Centre inspectors complete the routine form for drilling waste disposals employing the disposal methods in Sections 3 and 4 of *Guide 50*, while they complete the nonroutine form for disposal methods contained in either Section 5 or 6 of *Guide 50*.

1.2 What This Guide Contains

This guide contains instructions on the completion of inspection forms, process flowcharts on how to conduct both a physical inspection and a paper review, inspection forms (routine and nonroutine) that are to be completed, and a section outlining potential enforcement actions.

The guide includes

- process flow diagrams for both routine and nonroutine drilling waste disposal inspections, which detail the steps followed by an EUB field inspector when conducting an inspection or a paper review
- Drilling Waste Disposal Inspection Forms—Routine and Nonroutine
- Notification of Drilling Waste Disposal form
- routine and nonroutine disposal inspection operational deficiencies
- audit referral sheets—in some cases when a more detailed review is warranted, the field inspector may refer a drilling waste disposal to the EUB's Operations Group for a more thorough audit using these forms
- four appendices:
  1) *Informational Letter (IL) 99-4: EUB Field Surveillance Enforcement Process and Ladder*
  2) Sample Completed Notification Forms
  3) Enforcement and Compliance Regarding Waste Audits and Inspections
  4) Audit Referrals

1.3 Types of Inspections

During the field inspection, the EUB inspector reviews the well licensee's practice of managing and handling drilling waste. The goal of the process (see flowcharts in Sections

2 and 3) is to provide ongoing monitoring of drilling waste disposal operations and to determine if *Guide 50* criteria are being met. The process may include a review of the Notification of Drilling Waste Disposal form (see *Guide 50*, Section 2.5) and/or a field inspection of the disposal site. The field inspection is completed by EUB field staff and may occur any time during or after the actual disposal. The field inspection process is designed to allow the inspector flexibility to target inspection options and disposals that represent a specific concern(s).

1.3.1 Routine and Nonroutine Drilling Waste Disposal Inspections

Drilling waste disposals that employ methods in Sections 3 and 4 of *Guide 50* are considered to be routine disposal options, and as such a **routine** drilling waste disposal inspection process is followed, as described in this guide in Section 2. Examples of routine disposals include (but are not limited to) mix-bury-cover and pump-offs. The **nonroutine** disposal inspection process and forms are used when disposals occur using Sections 5 and 6 of *Guide 50*. Examples of nonroutine disposals include (but are not limited to) land treatments and disposals to landfills.

1.3.2 Notification of Drilling Waste Disposal

Guide 50 requires that for every drilling waste disposal in the province of Alberta a Notification of Drilling Waste Disposal form be submitted to the appropriate regulatory agency (see *Guide 50*, Section 1.2: Information Requirements). Well licensees must complete all relevant information and submit the form 48 hours prior to disposal.

1.4 Inspector's Conduct

The purpose of inspections is to achieve compliance with *Guide 50* regulations and ensure "safe and efficient practices" for all drilling waste disposals.

EUB inspectors represent the EUB and must display a positive attitude and fairness to all operators.

For safety and other reasons, staff may, at their discretion, notify company personnel prior to conducting an inspection. The inspector must comply where possible with company policies, such as regarding notification prior to inspection, lease entry, and/or the use of specific safety equipment.

When conducting an inspection, the inspector must have a copy of this guide on site. The inspector must also have a copy of other pertinent EUB reference documents, including

- *Guide 50: Drilling Waste Management*
- *Guide 55: Storage Requirements for the Upstream Petroleum Industry*
- *Guide 58: Oilfield Waste Management Requirements for the Upstream Petroleum Industry*
- *Internal Guide 8: Safety Manual*

Inspectors must always use a cooperative approach as the first method attempted to achieve company compliance with EUB regulations. Where practical, they should have a brief discussion with the company's senior personnel on site after the inspection. This opportunity should be used to establish contacts, exchange information, discuss deficiencies, enforcement, and follow-up, and enhance relations.

1.5 Safety

Inspectors must refer to EUB *Internal Guide 8: Safety Manual* prior to inspection of any facility and be sure to follow all requirements.

Inspectors should point out any unsafe operating conditions and practices to the operator. If necessary, the inspectors must also advise Alberta Human Resources and Employment, Workplace Health and Safety (formerly OH&S) and/or Alberta Municipal Affairs, Safety Services (formerly Electrical Protection).

1.6 Industry Compliance

If through the inspection process the EUB has concerns regarding a well licensee's management on a provincial basis (as tracked by the EUB Operations Group) or finds a continued lack of response to the EUB Field Centre's requests, the inspector may forward the file to the Operations Group for an audit. The audit process may incorporate individual well locations or the waste management practices of the well licensee as a whole.

The EUB believes that compliance in meeting or exceeding regulations and standards is the responsibility of the energy industry. The EUB expects all industry participants to understand the current requirements and have an infrastructure in place to ensure compliance. However, the EUB also recognizes that on occasion enforcement of regulations will be required to ensure compliance.

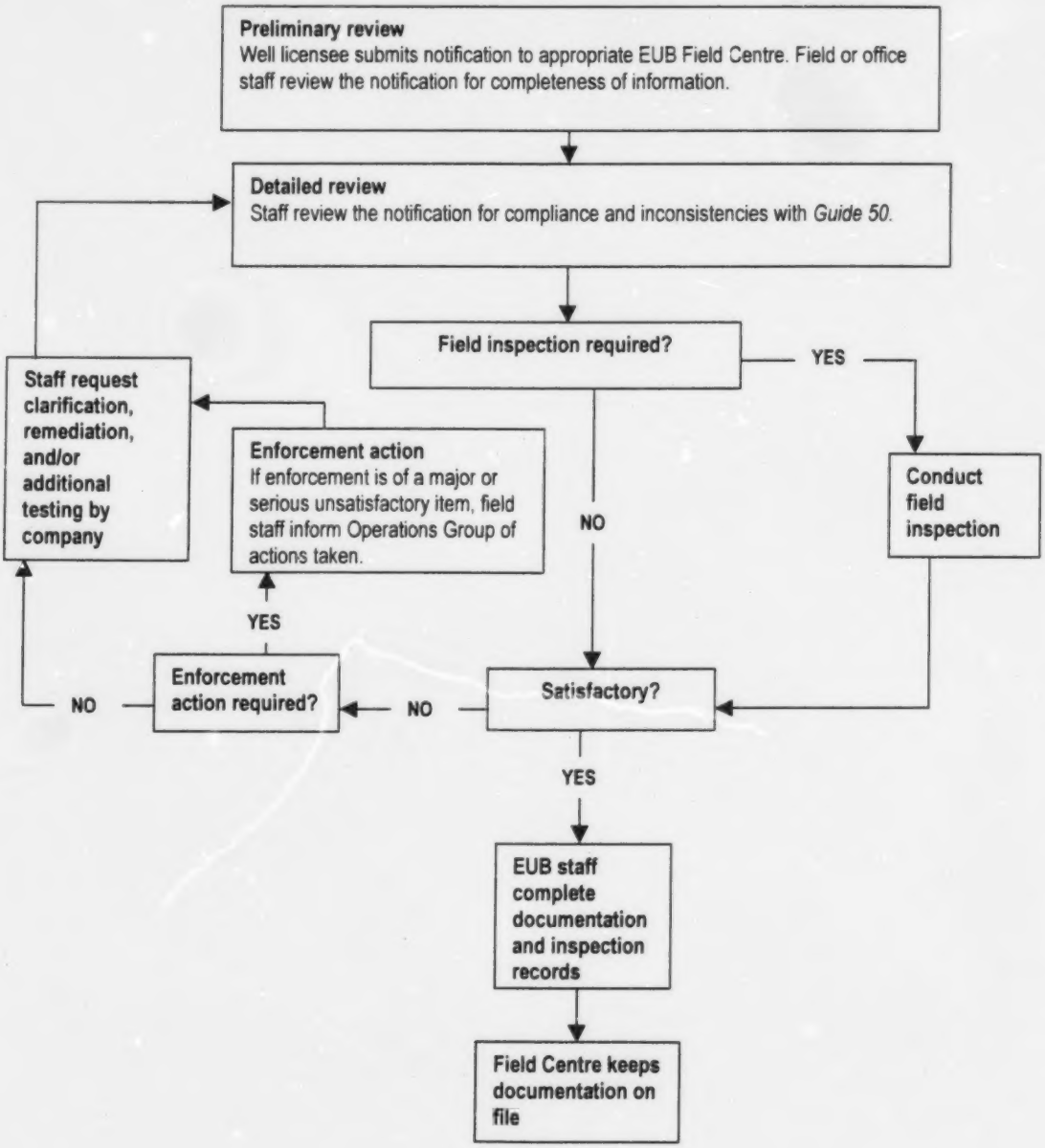
The EUB has implemented an enforcement policy to address the business issue of noncompliance with provincial requirements. *IL 99-4: EUB Field Surveillance Enforcement Process and Ladder* (Appendix 1) defines the enforcement consequences when operators fail to meet requirements and/or regulations. These consequences escalate to a higher severity when the operator fails to address EUB requirements and requests or if noncompliance of a higher severity is found during a subsequent inspection.

The criteria for determining the level of noncompliance are defined in Sections 2.5 and 3.5 on operational deficiencies. EUB Field Centre inspectors follow these criteria when completing the Drilling Waste Disposal Inspection Form and determining the resulting enforcement action.

Field inspectors issuing noncompliances must forward a copy of the enforcement letter by fax or mail to the EUB Operations Group for tracking purposes. The Operations Group maintains a provincewide record of noncompliances resulting from audits and field inspections. Field inspectors may request a copy of noncompliances at any time to aid in enforcement evaluations (i.e., in determining escalating enforcement actions). At least once a year, the Operations Group provides a breakdown of all major or serious field inspection and audit noncompliance items to the field inspectors for the past year.

2 Routine Drilling Waste Disposal Inspections

A routine disposal is defined as any disposal that is described in *Guide 50* and does **not** require preapproval (e.g., those disposal options in Sections 3 and 4 of *Guide 50*, including mix-bury-cover, landspread, landspray, landspray while drilling, and pump-off). Flowchart 1 shows the inspection process for routine disposals.


Preliminary review
Well licensee submits notification to appropriate EUB Field Centre. Field or office staff review the notification for completeness of information.
Detailed review
Staff review the notification for compliance and inconsistencies with Guide 50.
Field inspection required?
YES
NO
Staff request clarification, remediation, and/or additional testing by company
Enforcement action
If enforcement is of a major or serious unsatisfactory item, field staff inform Operations Group of actions taken.
Conduct field inspection
YES
Enforcement action required?
NO
NO
Satisfactory?
YES
EUB staff complete documentation and inspection records
Field Centre keeps documentation on file

Flowchart 1. Field Surveillance Inspection Process—Routine Disposals

2.1 Preliminary Review—Routine Disposals

The purpose of the preliminary review is to ensure that the submitted notification form is complete and to select notifications for further review by inspection staff.

Guide 50 requires EUB Field Centre staff to record the receipt of all of the Notification of Drilling Waste Disposal forms on the Spud Spreadsheet, making entries in unused columns. As well, the Field Centre should keep notification forms for a minimum of one year.

Field Centres conduct preliminary reviews of notification forms at random as the forms are received. Field Centres should choose a reasonable number of notifications for preliminary review based on the number of notifications received and available staff resources. Appropriately trained administration staff, Field Centre technicians, and/or field inspectors may do the preliminary review.

2.1.1 How to Conduct a Preliminary Review

Those notification forms randomly chosen by Field Centre staff are given a preliminary review by first comparing the submitted form to the sample completed notification forms provided in Appendix 2. These samples highlight the required information that must be filled in on a submitted notification form. They aid EUB staff in reviewing notification forms for completeness and adherence to *Guide 50*.

In addition, a submitted notification form must include the information listed below. When EUB staff review the submitted notifications, they select those needing follow-up detailed review, as noted.

- Correct Field Centre – ensure that the notification form has been sent to the correct EUB Field Centre; if not, forward the forms to the correct centre.
- Completeness – select if obviously incomplete or missing key information.
- Notification generated using CGI – select if the notification is not CGI generated.
- Mud type – select nontypical (e.g., invert, potassium chloride [KCL], or salt-based systems).
- Well-related criteria – select if the answer is "yes" to any of the questions at the bottom of page 1 of the notification form.
- Random selection – selection based on inspector and Field Centre discretion (e.g., 1 in 10).

In addition to the above selection criteria for a detailed review, the following criteria may also trigger a more detailed review of a disposal operation and associated information:

- Well licensees or disposal companies with poor performance records
- Specific disposal type of concern in area (e.g., landspray while drilling in heavy snow areas, remote sumps)

- Mix-bury-cover with ratios greater than 4 to 1
- Unusually large volume for area (e.g., greater than 2000 m^3)
- Solids loading rate greater than 6 tonnes/hectare
- Specific locations flagged because of complaints

2.1.2 Preliminary Review Closure

If when comparing the submitted notification form to the sample completed forms it is evident that information is missing or erroneous, the notification form is then forwarded to an EUB field inspector for a detailed review. If the preliminary review finds that there is no information missing or erroneous, the notification form is simply filed following normal Field Centre protocol on the Spud Spreadsheet and kept on file for a minimum of one year. The completion of an inspection form is **not required.**

2.2 Detailed Review—Routine Disposals

The purpose of the detailed review is to review the submitted notification form to ensure compliance with *Guide 50*. During the detailed review, the EUB field inspector may request clarification or more information from the pertinent oil and gas company (i.e., the well licensee).

A detailed review is conducted when a notification form has been found to have errors after having gone through a preliminary review. The Field Centre staff who conducted the preliminary review (if different from the field inspector conducting the detailed review) should ensure that all necessary notification forms and associated field disposal reports generated by the well licensee are forwarded to the field inspector. Once the field inspector receives the notification form and begins the detailed review, the inspector may decide whether to include a site investigation as part of the detailed review.

2.2.1 How to Conduct a Detailed Review

The review entails completion of Part 5: Records Review on the Drilling Waste Disposal Inspection Form—Routine. For a guide on how to complete this, see Section 2.4, B, 5. The field inspector reviews the notification forms and compares the submitted information against the sample forms found in Appendix 2. These sample completed notification forms, along with *Guide 50*, provide all necessary information to determine the level of compliance. The samples highlight the required information that must be filled in on a submitted notification form. They aid EUB staff in reviewing notification forms for completeness and adherence to *Guide 50*.

In addition, the following information may be requested from the well licensee for further clarification:

- Laboratory reports, if no analytical data are provided or to verify that the submitted analytical values on the notification form match those values on the laboratory report
- Microtox bioassay data, if required but not reported or to verify that the information reported on the submitted notification forms matches that on the laboratory report

- Landowner agreements, if not indicated on the notification form—the landowner information should be dated prior to any disposal dates
- Field records (i.e., sampling reports, disposal reports, and proof of disposal dates)
- Mud products list, if questioned or not identified
- Trucking records, if the disposal location is questioned
- Survey plans of lease area
- Site diagrams of disposal area
- Details on previous disposals, if site used before
- Method of determination of groundwater depth

The notification forms, along with any of the above additional information, are reviewed for compliance with *Guide 50*. Any noncompliance items are entered on the Drilling Waste Disposal Inspection Form—Routine (see Section 2.4).

To aid in the identification of noncompliance items, field inspectors should refer to Section 2.5: Routine Disposal Inspection Operational Deficiencies.

Once all noncompliance items are identified and recorded on the Drilling Waste Disposal Inspection Form—Routine, the field inspector decides whether a field inspection is required. To aid in this decision, see Section 2.3: Field Inspection.

2.2.2 Detailed Review Conclusion

The detailed review is concluded when all of the submitted information has been reviewed. If there are no noncompliance items, this is indicated on the Drilling Waste Disposal Inspection Form—Routine, which is then filed, along with the notification form, following normal Field Centre protocols, for a minimum of one year. If there are noncompliance items, the field inspector decides whether to carry out a field inspection (see Section 2.3.1).

If a field inspection is not warranted but there are noncompliance items to be addressed, the field inspector writes and sends an enforcement letter to the well licensee. See Appendix 3 for enforcement and compliance issues associated with drilling waste disposal inspections.

2.3 Field Inspection—Routine Disposals

A field inspection consists of the field inspector visiting the well site and, in some cases, the associated disposal areas or remote sump locations in order to determine the level of compliance.

2.3.1 When to Conduct a Field Inspection

If it is determined from the detailed review that the disposal was not conducted in full compliance with *Guide 50*, the field inspector must decide whether a field inspection is also required.

Items that may indicate a need for a field investigation include the following:

General

- Notification form and/or other information supplied is incomplete.
- Information on notification form is contradictory or does not correspond with other information supplied.
- Disposal appears to have occurred or will occur in a sensitive area.
- Sump location is different from the well surface location.
- Dates on notification form indicate disposal within 48 hours of notice (except landspray while drilling post-disposal).
- Any of the questions at bottom of page 1 of the notification form is answered "yes."
- Well licensee or service company has poor compliance record.
- Public complaints or landowner concerns exist.

Landspray While Drilling and Landspray

- Waste material contains oil; cannot landspray while drilling if oil is present in waste.
- Solids loading rate is exceeded.
- Previous land use is not identified.
- Maximum application rates are exceeded.
- Waste is reported as "solids" or mud density is high (i.e., > 1200 kg/m^3).
- Reported application rate is at limit (40 m^3/hectare, summer; 20 m^3/hectare, winter).
- Off-site disposal location coordinates do not correspond with area on spread map.
- Receiving soil criteria are not met (i.e., electrical conductivity [EC] and sodium absorption ratio [SAR]).
- Off-site disposal location (or mapped area) does not approximately equal proposed area used.
- No landowner information is provided.
- Disposal occurred in an area that may be near a water body.
- Waste with less than 0.5 per cent oil may be landsprayed but only if incorporated within two weeks. (This is not applicable for landspray while drilling disposals.)

Mix-Bury-Cover and Landspread

- There is a very large volume of waste (>2000 m^3 liquid or total waste).
- Waste contains any quantity of oil.
- A higher than 3/1 mix ratio is required.
- Receiving soil is identified as coarse soil texture (sand, gravel).
- There is an indication of a shallow water table (<5 m).
- There is an indication that the site has been used for disposal before.

Pump-off

- Waste material is reported as "solids" or "total waste."
- Waste details are not reported under "clear liquids."
- No landowner information is provided.
- Off-site disposal location given does not correspond to proposed area.

2.3.2 Who Conducts a Field Inspection

Any EUB field inspector who has undergone the appropriate training or has greater than five years' inspection experience may conduct a drilling waste disposal field inspection. The appropriate training consists of the field inspector having attended the EUB Field Training School and having gone out to at least three drilling waste disposal operations with a senior field inspector.

2.3.3 How to Conduct a Field Inspection

Physical inspection of the drilling waste disposal location, storage location, and/or disposal operations is conducted and the Drilling Waste Disposal Inspection Form–Routine is completed. See Section 2.4 for instructions on completing this form.

During the field inspection, the field inspector must have a copy of this *Guide 70* and *Guide 50*, as well as any other pertinent EUB documents. The field inspection may include a visual inspection of

- sumps on site and associated remote sumps,
- pump-off areas,
- landspray areas, or
- landspread areas.

The inspector must record any noted problems, including any deficiencies, on the routine disposal inspection form. Each unsatisfactory item must be noted in the most appropriate place rather than in two or more places. Section 2.4 provides detailed instructions on how to complete the routine disposal inspection form.

The Drilling Waste Disposal Inspection Form is used as a written record of every inspection item examined. In addition, the inspector must ensure that the inspection is entered on any required tracking sheets, in accordance with Field Centre protocols. Upon completion of the field inspection, the field inspector returns to the Field Centre to compile and review the site visit findings.

2.3.4 Field Inspection Closure

Once the inspector completes the inspection form following Section 2.4, the results of the detailed review and the field inspection are compiled and all noncompliance items are noted. Section 2.5: Routine Disposal Inspection Operational Deficiencies identifies potential noncompliance items. It may also be necessary to contact the well licensee for additional information to allow closure of the review. This may include confirmation or explanation of the site inspection findings.

If after the field inspection it is determined that there are no noncompliance items and the well licensee has responded to all detailed review questions to the satisfaction of the field inspector, the file is considered closed and all documents are filed, following Field Centre protocols, for a minimum of one year.

A review and inspection are considered satisfactory if

- the disposal notification form and waste storage and/or disposal procedures meet the appropriate requirements,
- there are no outstanding noncompliance issues, as identified in Section 2.5, and

- all requested information has been received and additional clarification is not required.

If the field inspection uncovers noncompliance issues, enforcement action is implemented in accordance with field surveillance enforcement ladders in *IL 99:4* (Appendix 1). The field inspector coordinates enforcement of any routine disposal enforcement actions, notifying the Operations Group in Calgary for tracking purposes by mailing or faxing a copy of the enforcement letter to them. At a minimum, the enforcement letter sent to the well licensee must identify the level of noncompliance, the details of the noncompliance(s), and the required corrective actions. Appendix 3 explains the enforcement procedures for noncompliance issues.

If a field inspector deems the noncompliance to be a widespread issue for a well licensee (i.e., of provincewide concern) or extremely serious, the inspector may recommend that the Operations Group conduct an audit. This may include a thorough review of the notification form and well file information or it may incorporate a review of company waste management practices. An inspector recommending an audit must contact the Drilling Waste Specialist attached to the Operations Group in Calgary and send a completed Audit Referral form (Appendix 4), along with any additional information available and details of action taken.

If the Operations Group decides not to perform an audit, it will return the referral and provide a written explanation.

2.4 Completing the Drilling Waste Disposal Inspection Form—Routine

Note that the inspection form is in abbreviated format: each item on the form may require several things to be inspected. Also note that while the routine disposal inspection form covers many types of disposals, only the items specific to the disposal option being checked should be filled out. Enter "NA" in the box next to any item not inspected or applicable.

EUB Alberta Energy and Utilities Board — Drilling Waste Disposal Inspection Form-Routine

A. IDENTIFICATION

WELL LICENSEE

INSPECTION DATE

WELL LOCATION

WELL LICENCE NUMBER

SUMP LOCATION (IF REMOTE)

MUD TYPE

DISPOSAL TYPE:

- ☐ Landspray while drilling
- ☐ Landspray
- ☐ Pump-off
- ☐ Landspread
- ☐ Mix-bury-cover
- ☐ Common sump

Type of record review: ☐ Pre-disposal ☐ Disposal ☐ Post-disposal

Type of field inspection: ☐ Pre-disposal ☐ Disposal ☐ Post-disposal

B. INSPECTION RESULTS (Code: Satisfactory "X"; Minor Unsatisfactory "U"; Major Unsatisfactory "M"; Serious Unsatisfactory "S"; Not Applicable "NA")

1. SITE ASSESSMENT (GENERAL)

- 1.1 ☐ Well site information
- 1.2 ☐ Disposal method
- 1.3 ☐ Waste material and mud type
- 1.4 ☐ Waste volume
- 1.5 ☐ Signage and security
- 1.6 ☐ Compliance with other EUB requirements

2. SAMPLING

- 2.1 ☐ Waste sampling procedures
- 2.2 ☐ Soil sampling procedures
- 2.3 ☐ Storage and transportation
- 2.4 ☐ Sample documentation
- 2.5 ☐ Analytical procedures (field testing)

3. ON-SITE DISPOSAL (MIX-BURY-COVER, LANDSPREAD)

- 3.1 ☐ Waste containment
- 3.2 ☐ Mix ratio and application rates
- 3.3 ☐ Total loading and receiving soil limits
- 3.4 ☐ Soil cap and base for mix-bury-cover
- 3.5 ☐ Notification and time requirements

4. OFF-SITE DISPOSAL (LANDSPRAY WHILE DRILLING, LANDSPRAY, PUMP-OFF)

- 4.1 ☐ Waste control and containment
- 4.2 ☐ Receiving soils
- 4.3 ☐ Disposal procedures
- 4.4 ☐ Management of hydrocarbons and toxicity
- 4.5 ☐ Off-site disposal location accuracy
- 4.6 ☐ Solids loading and application rates
- 4.7 ☐ Landowner consent
- 4.8 ☐ Notification and time requirements

5. RECORDS REVIEW

- 5.1 ☐ Notification procedures
- 5.2 ☐ Notification forms and support data
- 5.3 ☐ Disposal calculations
- 5.4 ☐ Analytical data

6. OVERALL INSPECTION RESULTS

ENFORCEMENT ACTION

Satisfactory Inspection (no action required) ☐

Unsatisfactory Inspection (see reverse) ☐

Noncompliance Level: _____

Consequences of Noncompliance: _____

C. COMMENTS

_____

_____

_____

_____

_____

_____

_____

Inspector's Name _____

Phone Number _____

Fax Number _____

OPERATORS must ensure that the necessary work detailed under Comments (C) on reverse is completed and confirmed by the deadline date. Contact the local EUB Field Centre or fax a copy of this inspection with your comments to the Field Centre. Be sure to include your name and phone number. Check all of your other facilities in the area for the same deficiencies.

ENFORCEMENT ACTIONS REQUIRED

Minor Level 1
- Local company representative instructed to take corrective action.
- Company must confirm corrective action (**verbally or in writing**) to EUB field centre.
- Maximum time to take corrective action is 30 days.

Minor Level 2
- Local company representative instructed to take corrective action.
- Senior company representative with provincial authority must provide in writing to EUB field centre an explanation of why EUB directive not followed and an acceptable action plan for following EUB directives in the future.
- Maximum time to take corrective action is 15 days.

Minor Level 3
- Full or partial suspension of operations.
- Local company representative instructed to take corrective action.
- Senior company representative with provincial authority must provide in writing to EUB field centre an explanation of why EUB directive not followed and an acceptable action plan for following EUB directives in the future.
- Suspension remains in effect until noncompliance is remedied, a documented meeting/discussion is held with senior company representative with provincial authority, and the EUB removes suspension **in writing**.
- Noncompliance added to Corporate Data Information System.

Minor Level 4
- Immediate suspension (full or partial).
- Suspension remains in effect until documented meeting with senior company representative with provincial authority (VP/Pres).
- Senior company representative with provincial authority confirms compliance at this and all similar facilities in this inspection category.
- Senior company representative with provincial authority must provide a written acceptable action plan, including examination of cause and future prevention plans at this and all similar facilities.
- EUB Corporate Compliance may issue closure order, miscellaneous order, and/or refer status for future applications.

Major Level 2
- Temporary suspension, when safe to do so, may occur (full or partial) to correct deficiency or alleviate impact or potential impact.
- Local company representative instructed to take corrective action.
- Senior company representative with provincial authority must provide in writing to EUB field centre an explanation why EUB directive not followed and an acceptable action plan for following EUB directives in the future.
- Company has 30 days to correct operations in same inspection category on a provincial basis.

Major Level 3
- Same as Minor Level 3.
- Company has 15 days to correct operations in same inspection category on a provincial basis.

Major Level 4
- Same as Minor Level 4.

Serious Level 3
- Full or partial suspension of operations when safe to do so.
- Company instructed to take corrective action.
- Company must explain why event occurred, provide written acceptable action plan, and ensure that issue/event does not reoccur.
- Company must confirm that this and all similar facilities are in compliance.
- Operations remain suspended until noncompliance remedied, EUB accepts action plan, and written approval is received from EUB to resume operations.
- Noncompliance added to Corporate Data Information System.

Serious Level 4
- Same as Major Level 4.

Note: The above listed enforcement action items are summarized from the EUB Field Surveillance Enforcement Ladder in *Informational Letter (IL) 99-4*. Please refer to this IL or contact the local EUB field centre for further details. The EUB reserves the right to escalate noncompliance issue(s) to any level should conditions warrant.

How to Complete the Drilling Waste Disposal Inspection Form—Routine

A Identification

Well licensee — Enter the complete name of the well licensee, as indicated on the submitted notification form.

Inspection date — Enter the date of the field inspection.

Well location — Enter the well location, as indicated on the submitted notification form.

Well licence no. — Enter the well licence number, as indicated on the submitted notification form.

Sump location — If the sump location is remote, enter the sump location, as indicated on the submitted notification form.

Mud type — Enter the type of mud, as stated on the submitted notification form.

Disposal type — Check the chosen disposal option, as stated on the submitted notification form.

Type of record review — Check the appropriate box to indicate if the review took place pre-disposal, during the disposal, or post-disposal.

Type of field inspection — Check the appropriate box to indicate if the inspection took place pre-disposal, during the disposal, or post-disposal.

B Inspection Results

1 Site Assessment (General)

1.1 Well site information

The unique well or surface location is correct on the notification form and matches that of the actual well in question.

If the sump is not on the well site, the off-site location is reported on the notification form. Confirm that the sump location is correct on the notification form.

1.2 Disposal method

The disposal method used is the same as that reported on the notification form. If more than one method of disposal is used, separate notifications have been submitted.

The disposal option was/is suitable for the location. Examples of combinations of unsuitable disposal sites and disposal options include

- building a sump in porous/coarse soil
- disposing of drilling waste on roads

Alberta Sustainable Resource Development, Forestry Division, currently has criteria, Disposal on Licence of Occupation [DOLOC], for spreading on lease of occupation [LOC] roads. Approval from the Forestry Division is required on a site-by-site basis. Disposal on roads other than LOCs or outside the DOLOC criteria is not permitted.

- landspreading on topsoil

  In most cases the landspread is to be conducted on the C horizon. Discretion is allowed for cases where the well-site subsoil is only stripped down to the Bt soil horizon.

1.3 Waste material and mud type

The mud type used matches the mud type reported on the notification form. To dispose of drilling waste using land applications, the system must be nontoxic. To determine this, check the reported bioassay results or toxic mud product use.

If hydrocarbons are present in the drilling wastes, check that the appropriate testing was conducted (i.e., microtox and oil content). Hydrocarbons must not be present in the drilling waste if disposed of by landspray while drilling or pump-off. No visible hydrocarbons are permitted for landspray while drilling or pump-off.

Disposal of toxic material may be determined by the reported bioassay results or by knowledge of toxic mud product use. You may also refer to the PSAC Drilling Fluid Product List for Potential Toxicity; however, this list does not contain some common products known to be nontoxic, such as sawdust, bentonite, and gypsum. A current copy of the PSAC list may be found on the Web site at <www.psac.ca/toxicity/html>. If there are concerns with the mud products, you may request material safety data sheets [MSDS] from the well licensee or from the EUB Operations Group. (If the original microtox is <75 per cent, which is a fail result, a charcoal treatment and oil analysis must be completed. The well licensee is responsible for determining what has caused the toxicity and the appropriate treatment of the material.)

Check the mud system used to determine if it is an approved mud system for landspray while drilling, limited to the following:

- A gel chemical mud, also referred to as gel polymer mud, generally consists of water, bentonite, caustic, fluid loss additives (e.g., starches), weighting agent (barite, calcium carbonate), and thinners/deflocculant (polymers).

- Floc water, as it consists of water, coagulants (gypsum, calcium nitrate, potassium sulfate), and a flocculant (polymer).

- Calcium-based muds (lime mud or gypsum mud) are used when anhydrite or salt sections are encountered during drilling. They consist of water, bentonite, gypsum, caustic, fluid loss additives, thinners, and a weighting agent.

For mud systems containing salt products, operators should contact the EUB Operations Group. These systems are currently under review.

The EUB allows no disposals of mud systems other than the three listed in *Guide 50*, Section 4.3, without prior written consent from the EUB.

1.4 Waste volume

The waste volume reported matches the volume being disposed of. Consideration should be given to potential increases due to major rainfalls.

1.5 Signage and security

A remote sump site has signage identifying the well licensee and location. The sump is fenced to prevent public and animals from entering it—i.e., the site does not pose a public hazard.

1.6 Compliance with other EUB requirements

Only drilling wastes are disposed of using *Guide 50*. Other oilfield wastes, such as frac fluids and sands and flare pit materials, are managed in accordance with *Guide 58*.

2 Sampling

This section of the inspection form ensures that all sampling protocols and procedures are adhered to. Guide 50, *Section 2, contains information on sampling requirements.*

2.1 Waste sampling procedures

Ensure that the appropriate number of samples is being taken for landspray while drilling. The well licensee must ensure that each section of the drillhole is tested and evaluated. Even though the *Guide 50* Drilling Waste Program (CGI) averages the results, each section of the hole must not exceed the analytical criteria as defined in Section 4.3 of *Guide 50*. For number and locations of sample requirements, see *Guide 50*, Section 2.

2.2 Soil sampling procedures

Samples of the receiving soils (i.e., off-site soils onto which the drilling waste will be disposed) have been taken prior to the disposal taking place. The number of samples meets *Guide 50*, Section 2, requirements.

- For a sump, there are a minimum of 5 sample points for the first 500 m^2 and an additional point for every 100 m^2 beyond that to a maximum of 10 sample points.
- For landspray while drilling and landspray, there is one sample for every 8 hectares of disposal area.

2.3 Storage and transportation

If sampling is ongoing during the inspection, the sample containers should be checked to ensure that the samples are collected in appropriate containers that are clean and do not contain other contamination. Samplers use glass for oil content and microtox testing.

Samples are kept cool during storage and transportation *and are not stored for an unacceptable length of time prior to testing.* Microtox testing is done within 72 hours.

2.4 Sample documentation

Samples are appropriately labelled (type, source, and date). The company conducting the sampling has documented sampling procedures and the representatives on site have a copy of these procedures.

There is a map or sketch of the sampled area or sump, with the sample locations shown.

2.5 Analytical procedures (field testing)

Analytical tests are not limited to those identified in *Guide 50*, Appendix 1; however, they must be standard methods. Testing using strips is acceptable for **screening** analysis (e.g., chloride, pH) in the mud system, but is not acceptable in the determination of final values. As magnesium (Mg) occurs in small quantities, it is difficult to perform an accurate field test for magnesium. If SAR is required by field testing, it may be calculated using sodium (Na) and calcium (Ca) results only or by using total hardness. The total hardness value is substituted for the calcium value.

In order to use field testing, there must be complete and appropriate quality assurance/quality control (QA/QC) programs. For both laboratory and field testing, the company completing the sampling must maintain a QA/QC program. Ask how the company maintains this program and check calibration data of the analytical equipment used for that same day.

3 On-site disposal (mix-bury-cover, landspread)

This section deals with the mix-bury-cover and landspread disposal options, in accordance with Guide 50, *Section 3.*

3.1 Waste containment

Wastes are contained by pits or berms. There is no potential for off-lease migration.

3.2 Mix ratio and application rates

For the landspread disposal option, the wastes are incorporated at a rate of at least three parts subsoil to one part waste. This may be determined by incorporation depth.

The actual area used for the spread is that stated on the notification form; this ensures that the maximum application rates are not exceeded.

For the mix-bury-cover option, there is a ratio of three parts subsoil to one part waste or a minimum mix as determined by waste and soil characterization if greater than 3/1.

The mix is consistent. If soil is being pushed directly into a pit or frozen chunks are being mixed, a consistent mix ratio is not likely being met. Consistency is required to ensure adequate, natural movement of surface water through the mix.

3.3 Total loading and receiving soil limits

The lifetime loading limits for chlorides or nitrogen are not exceeded. The total must take into account all disposals by all methods at the location. The inspector may request information on prior disposals from the company. If the disposal history of the site is not available, the field inspector may request the well licensee to conduct an assessment of the receiving soils. This assessment must include an analysis for all parameters as outlined for the particular disposal option in *Guide 50*.

Receiving soils do not exceed EC $\leq$ 4 decisiemens per metre (dS/m) and SAR $\geq$ 8 limits for a landspread disposal. Disposals on subsoils with EC > 4 and SAR > 8 can only be done if the predicted values of EC and SAR after mixing are no more than one unit above the background. However, if EC and SAR have already been increased by prior disposals, further increase is unacceptable.

3.4 Soil cap and base for mix-bury-cover

The excavated material from the sump is replaced to a depth of at least 1 m.

- If this is in question, the inspector may request that the well licensee core the site.
- If the operation is ongoing during the site visit, the inspector may observe the process.

The final waste mix is not 1 m above the water table or permeable material (e.g., sand lenses). This can be determined by a detailed audit, including coring or evacuation, or by sampling, observation of surrounding area, or maps provided by Alberta Environment.

3.5 Notification and time requirements

The company has given the appropriate regulatory agency 48-hour notice prior to disposal. This ensures that the Field Centre has time to review the disposal plan prior to disposal.

- To conduct disposal earlier, the well licensee must receive explicit approval from the Field Centre.

EUB Field Centre staff may call the well licensee to confirm the disposal date or field inspection.

4 Off-site disposal (landspray while drilling, landspray, pump-off)

This section deals with the landspray while drilling, landspray, and pump-off disposal options, in accordance with Guide 50, *Section 4.*

4.1 Waste control and containment

Disposal does not occur within allowable distances from water bodies (including muskeg), 100 m in summer and 200 m in winter.

The disposal site should not have a slope > 5 per cent. If the slope is > 5 per cent, the potential for waste migration increases. Inspectors may use discretion in judging this.

There is no migration of drilling waste off of the disposal site. Heavy snow cover may increase concern about migration, even where the slope is minimal. Snow wind rows may minimize the potential for migration. A sudden rise in temperature and quick melting may also contribute to migration.

4.2 Receiving soils

Check the notification form to ensure that the spread is not occurring on receiving soils that exceed EC of 2 dS/m or SAR of 6. There are no exceptions to these maximum allowable levels.

4.3 Disposal procedures

Inspectors should walk the pump-off area to ensure that no solids or fluids containing solids are pumped off. Only clear liquids are permitted to be pumped off. The waste should be recorded under "clear liquids" on the notification form.

- This may be indicated by vegetation covered in a thick, grey film or coating.
- During the walk-about, check the disposal area to ensure that the disposal practices do not result in pooling, clumping, or erosion.
- Pump-off may not be appropriate during the winter months, as the material pools when thawed.

4.4 Management of hydrocarbons and toxicity

For the landspray while drilling and pump-off disposal options, the EUB field inspector is to inspect the disposal area to ensure that there are no hydrocarbons evident. Look for "rainbow hydrocarbon specks" in the fluids that were spread or inspect the sump/fluid storage areas. Wastes containing hydrocarbons may only be disposed of by landspray.

If hydrocarbons are present and spread during a landspray operation, the well licensee must properly address them.

- If hydrocarbons are present in the waste and the initial microtox bioassay is < 75 per cent, which is a fail result, the waste may not be landsprayed. In order to landspray, a charcoal treatment must result in > 75 per cent (a pass result).
- The oil content must then be determined, and the predicted hydrocarbon content in the soil/waste mix must be < 0.5 per cent on a dry weight basis.
- Waste must be incorporated within two weeks of landspraying when hydrocarbon is detected. Since incorporation cannot occur in frozen ground, landspraying must not occur in the winter.
- It is recommended that waste with a concentration of > 2 per cent oil in a sample be treated prior to spreading, even if the < 0.5 per cent criterion can be met.

The clear fluids pumped off must have passed the toxicity test prior to disposal. If the toxicity assessment fails and the dissolved hydrocarbons are at concentrations greater than or equal to 100 mg/L, the clear liquids must be treated prior to pump-off disposal. If the waste is treated, it must be reanalyzed before disposal. The well licensee is responsible to ensure that all analytical parameters as detailed in the individual disposal methods in *Guide 50* are addressed.

4.5 Off-site disposal location accuracy

The well licensee has given 48 hours' notice and the off-site spread area is complete and accurate on the notification form. The off-site disposal location must be completed by the well licensee and submitted on the notification form. Check in the field that the stated location is accurate in terms of site and size. Both the spread area map and accurate site coordinates are required.

4.6 Solids loading and application rates

The application rates for landspray or landspray while drilling as outlined in *Guide 50* are not exceeded.

- This rate may be the overall rate (no discretion allowed) or the specific area rate, if the spread is not consistent (inspector may use discretion).

- Application rates may be critical in sensitive areas or under dry, arid conditions.

Seasonal application rates and maximum limits are as follows:

- winter: $\leq 20\ m^3/ha$
- summer: $\leq 40\ m^3/ha$
- total dissolved solids (TDS) < 1800 kg/ha
- sodium (Na) < 250 kg/ha

The application rates for pump-off, as outlined in *Guide 50*, are not exceeded.

- Application rates may be critical in sensitive areas or under dry, arid conditions.

- The maximum application rate is $1000\ m^3/ha$ or less, as determined by the following loading criteria:
  - chloride $\leq$ 400 kg/ha
  - sodium $\leq$ 250 kg/ha
  - total nitrogen $\leq$ 200 kg/ha
  - TDS < 1800 kg/ha

4.7 Landowner consent

Landowner consent was obtained prior to off-site disposal occurring (check notification form). (The well licensee should be able to supply a written agreement with the landowner upon request.)

Guide 50 allows the movement of material off site for treatment or disposal. The EUB recommends that approval be obtained from the receiving landowner if drilling waste is moved from the originating lease to another lease for disposal.

4.8 Notification and time requirements

The well licensee has given 48 hours' notice to the appropriate regulatory agency prior to disposal (check notification form). The appropriate regulatory agency is determined as follows: for disposals on the green area of the province, the Alberta Sustainable Resource Development (ASRD) Forestry Division is to be notified; for disposals on the white area of the province, the Public Lands Division of ASRD is to be notified; if the disposal occurs on privately held lands, the appropriate EUB Field Centre is to be notified.

The actual landspray while drilling operation occurred within 48 hours of rig release. Exceptions to this must receive preapproval from the appropriate EUB Field Centre.

5 Records review

Complete this section if there is a detailed review or a field inspection. This section is not required to be completed for a preliminary review.

5.1 Notification procedures

The well licensee has submitted the notification form. EUB Field Centre staff should monitor the spud records to determine if notification forms are not being submitted.

- If the form was not submitted, contact the well licensee and request the forms. Also take enforcement action (see Section 2.5: Routine Inspection Operational Deficiencies).
- For landspray while drilling, the Field Centre may permit submission of a multiwell notice. The Field Centre determines information requirements for a multiwell notice.

The disposal occurred within 48 hours of notification to the appropriate regulatory agency. The appropriate regulatory agency is determined as follows: for disposals on the green area of the province, the ASRD Forestry Division is to be notified; for disposals on the white area of the province, the Public Lands Division of ASRD is to be notified; for disposals on privately held lands, the appropriate EUB Field Centre is to be notified.

Consider two working days from when the Field Centre receives a copy, usually a fax. No discretion is permitted unless the well licensee received approval from the Field Centre for early disposal. This may be checked by telephoning the well licensee to confirm the disposal date or field inspection.

For landspray while drilling, the detailed review should look at both the pre- and post-disposal notification forms. *Guide 50* does not give a specific time limit, but in Section 2.5 it states that post-disposal notifications must be submitted immediately after disposal. Use common sense when evaluating this item. For landspray while drilling, the data should be submitted within two months. This may be checked using a spud tracking system.

5.2 Notification forms and support data

See the sample completed notification forms (Appendix 2) for information required on the notification forms.

- Parts 1 and 2 of the notification form must be complete and accurate.
- Information required under the selected disposal option must be complete and accurate.
- Mud additives and mud list must be detailed, including any toxic components. A complete list of mud additives is required on all notification forms except pre-notification for landspray while drilling.
- The spread area information must be complete and accurate. Discrepancies may be detected when comparing the map to the location given.
- Well-related criteria information must be completed (see questions at the bottom of page 1 on the form: horizontal well, hydrocarbon added, salt zone encountered, nitrogen >400 kg added). If this area is not complete or the answer is "yes" to any of the questions, check in further detail to ensure appropriate waste management.
- The notification should be checked in more detail if it is not in the CGI format and/or if it appears that the CGI program is not being used. Submission to the database is not enforceable as it is a third-party service, but its use should be strongly encouraged.

5.3 Disposal calculations

If the CGI program has not been used, check calculations (ask the well licensee to submit calculations or get a copy of the CGI program for field use from the EUB Operations Group).

Check if any calculation errors have led to spread rates being exceeded.

5.4 Analytical data

Ensure that all required analytical data have been tested for. This may include salts, oil, metals, or toxicity bioassay for both wastes and receiving soils as required for the disposal method used. The company completing the sampling is required to maintain a QA/QC program for both laboratory and field-tested results. It is appropriate to ask how they are maintaining this program.

For landspray while drilling, each section of the drillhole is to be tested. This information may be entered on the CGI program under the multiple wells section. Evaluate each section for its appropriateness for landspray while drilling. Although the *Guide 50* Drilling Waste Program (CGI) averages the results, each section must not exceed criteria.

6 Overall inspection results

Enforcement Action

Enter "X" if the inspection is satisfactory.

Enter the appropriate code if the inspection is unsatisfactory:

- U - minor
- M - major
- S - serious

Indicate the appropriate noncompliance level and the potential escalating consequences for future noncompliances.

Comments

Note any unusual site conditions. Give written instructions that identify noncompliance items, expected action, and the deadline date for compliance.

Inspector's Name

Enter the inspector's name, phone number, and fax number, including area codes.

Submission of Form

Send one copy of the completed form to the Operations Group in Calgary.

2.5 Routine Disposal Inspection Operational Deficiencies

The **level** of each deficiency is based on the criteria set out in *IL 99-4* (Appendix 1).

Definitions of Unsatisfactory Inspections

- **Minor unsatisfactory event/inspection (U)** — a contravention of regulation(s) or requirement(s) that does not result in a direct threat to the public or the environment and does not adversely affect oil and gas operations.
- **Major unsatisfactory event/inspection (M)** — a contravention of regulation(s) or requirement(s) that an operator has failed to address or that has the potential to cause an adverse impact on the public or the environment.
- **Serious unsatisfactory event/inspection (S)** — a total disregard for regulation(s) or requirement(s) that is having or may have a significant impact on the public or the environment.

The EUB may escalate noncompliance issue(s) to any level should conditions warrant.

Compliance and Noncompliance Results

Inspection results are rated "X" - satisfactory, "U" - minor unsatisfactory, "M" - major unsatisfactory, or "S" - serious unsatisfactory. Items below are numbered in accordance with the Drilling Waste Disposal Inspection Form—Routine.

1 Site Assessment

1.1 Well site information

U 1. Unique well or surface location is incorrect on notification form.

U 2. Sump is not on well site and off-site location is not reported on notification form.

U 3. Sump location is incorrect on notification form.

1.2 Disposal method

U 1. Disposal method other than what was reported on the notification form was used.

M 2. Site is unsuitable for the disposal option.

M 3. Sump located in porous/coarse soil.

M 4. There is unauthorized disposal on roads.

M 5. There is landspreading on topsoil.

1.3 Waste material and mud type

U 1. Mud type other than what was reported on notification form was used.

M 2. There is disposal of toxic material.

Classify as serious if pump-off material was known to be toxic and disposed of regardless.

M 3. Hydrocarbons are present in drilling wastes and oil content was not tested or reported.

M 4. Hydrocarbons are present in drilling waste disposed of by landspray while drilling or pump-off.

M 5. A nonapproved mud system for landspray while drilling is used.

1.4 Waste volume

U 1. Waste volume is significantly different from that reported on the notification form.

U 2. Volume is too large to be managed by the planned disposal option.

1.5 Signage and security

U 1. Sump site has no signage identifying the well licensee or location.

U 2. Sump is not fenced to prevent public or animals from entering it. May escalate if site poses a public hazard.

1.6 Compliance with other EUB requirements

M 1. Other oilfield wastes or materials of unknown origin are being disposed of with drilling waste.

M 2. Storage requirements are not being met (*Guide 55*). (Although *Guide 55* does not address sumps/storage of material directly, some of the principles may apply.)

2. Sampling

2.1 Waste sampling procedures

U 1. Adequate mud samples are not taken during landspray while drilling disposal.

M 2. Samples taken are not representative of the waste material.

M 3. Sampling is incomplete or improper.

2.2 Soil sampling procedures

M 1. Samples of receiving soils are not taken prior to waste disposal.

U 2. Number of samples taken is inadequate for off-lease disposal area.

M 3. Sampling of receiving soils is incomplete or improper.

2.3 Storage and transportation

U 1. Samples are collected in containers that are not clean and may contain other contamination.

U 2. Inappropriate containers are used for waste type or intended tests.

U 3. Samples are not kept cool during storage and transportation.

U 4. Samples are stored an unacceptable length of time prior to testing.

2.4 Sample documentation

U 1. Samples are not appropriately labelled.

U 2. Sampling procedures are not documented.

U 3. Sample locations are not documented.

2.5 Analytical procedures

M 1. Analytical procedures are incomplete or improper.

U 2. QA/QC testing is incomplete or improper.

3 On-site disposal (mix-bury-cover, landspread)

3.1 Waste containment

M 1. Wastes are not contained by pits or berms and there is potential for off-lease migration.

M 2. Wastes have migrated off the intended disposal site. May escalate if migration was known and no steps were taken to prevent it.

3.2 Mix ratio and application rate

M 1. Failure to incorporate landspread wastes into the soil at three parts subsoil to one part waste.

M 2. Exceeds landspread maximum application rate as determined by waste characterization.

M 3. Fails to mix-bury-cover at ratio of three parts subsoil to one part waste or minimum mix as determined by waste and soil characterization, if greater than 3/1.

3.3 Total loading and receiving soil limits

M 1. Lifetime loading limits for chlorides or nitrogen are exceeded.

M 2. Receiving soils exceed EC ($\leq$ 4 dS/m) and SAR ($\geq$ 8) limits for a landspread disposal.

3.4 Soil cap and base for mix-bury-cover

U 1. Soil cap placed on mixed waste is less than 1 m.

M 2. Final waste mix is not 1 m above the water table or permeable material.

3.5 Notification and time requirements

U 1. Disposal is conducted within 48 hours of notification to the appropriate regulatory agency.

4 Off-site disposal (landspray while drilling, landspray, pump-off)

4.1 Waste control and containment

M 1. Disposal is closer than allowable limits to surface water.

M 2. Disposal site has a slope greater than 5 per cent.

M 3. There is migration of drilling waste off of the disposal site.

4.2 Receiving soils

M 1. Receiving soils exceed EC of 2 dS/m or SAR of 6. (The "one unit" allowable increase for saline/sodic soils may not be considered, as it applies to landspreading on site only.)

4.3 Disposal procedures

M 1. Solids or fluids containing solids are pumped off.

M 2. Disposal practices result in pooling, clumping, or erosion.

M 3. Cement returns are not isolated from the drilling waste during landspray while drilling.

4.4 Management of hydrocarbons and toxicity

M 1. Wastes containing hydrocarbons are disposed of by landspray while drilling or pump-off.

M 2. Hydrocarbons are not properly addressed in landspray.

M 3. Fluids pumped off have not passed toxicity test. May escalate if has adversely impacted the environment.

4.5 Off-site disposal location accuracy

U 1. Off-site spread area information is incomplete, inaccurate, or nonexistent.

U 2. There are discrepancies between actual and reported disposal area in regard to location and/or size.

4.6 Solids loading and application rates

M 1. Application rates for landspray or landspray while drilling as outlined in *Guide 50* are exceeded.

M 2. Solids loading rate on vegetation is exceeded. (Solids on vegetated land must be $\leq$ 6 tonnes/ha.)

M 3. Application rates for pump-off as outlined in *Guide 50* are exceeded.

4.7 Landowner consent

M 1. Failure to obtain landowner approval for off-site drilling waste disposal.

4.8 Notification and time requirements

U 1. Disposal by landspray while drilling conducted more than 48 hours after drilling completed.

U 2. Failure to inform the appropriate regulatory agency of landspray while drilling prior to drilling.

U 3. Disposal by pump-off or landspray conducted within 48 hours of notification to the regulatory agency.

5 Records review (no field inspection conducted)

5.1 Notification procedures

U 1. Failure to submit notification form to the appropriate regulatory agency.

U 2. Failure to inform the regulatory agency of landspray while drilling operations prior to drilling the well(s).

U 3. The disposal was completed within 48 hours of notification to the appropriate regulatory agency.

U 4. Post-disposal notification not submitted upon completion of landspray while drilling.

5.2 Notification forms and support data

U 1. Information required in Parts 1 and 2 of the notification form is incomplete or inaccurate.

U 2. Information required under the selected disposal option is incomplete or inaccurate.

U 3. Information is not submitted to the Drilling Waste Database.

U 4. Mud additives are not reported.

U 5. List of mud additives is incomplete.

U 6. Off-site spread area information (spread area map and site coordinates) is incomplete, inaccurate, or nonexistent.

U 7. Well-related criteria are not completed.

M 8. Disposal in area not agreed to by landowner.

5.3 Disposal calculations

U 1. Calculation errors made in calculations based on formulas outlined in *Guide 50*. May escalate if errors caused exceedance in loading limits.

5.4 Analytical data

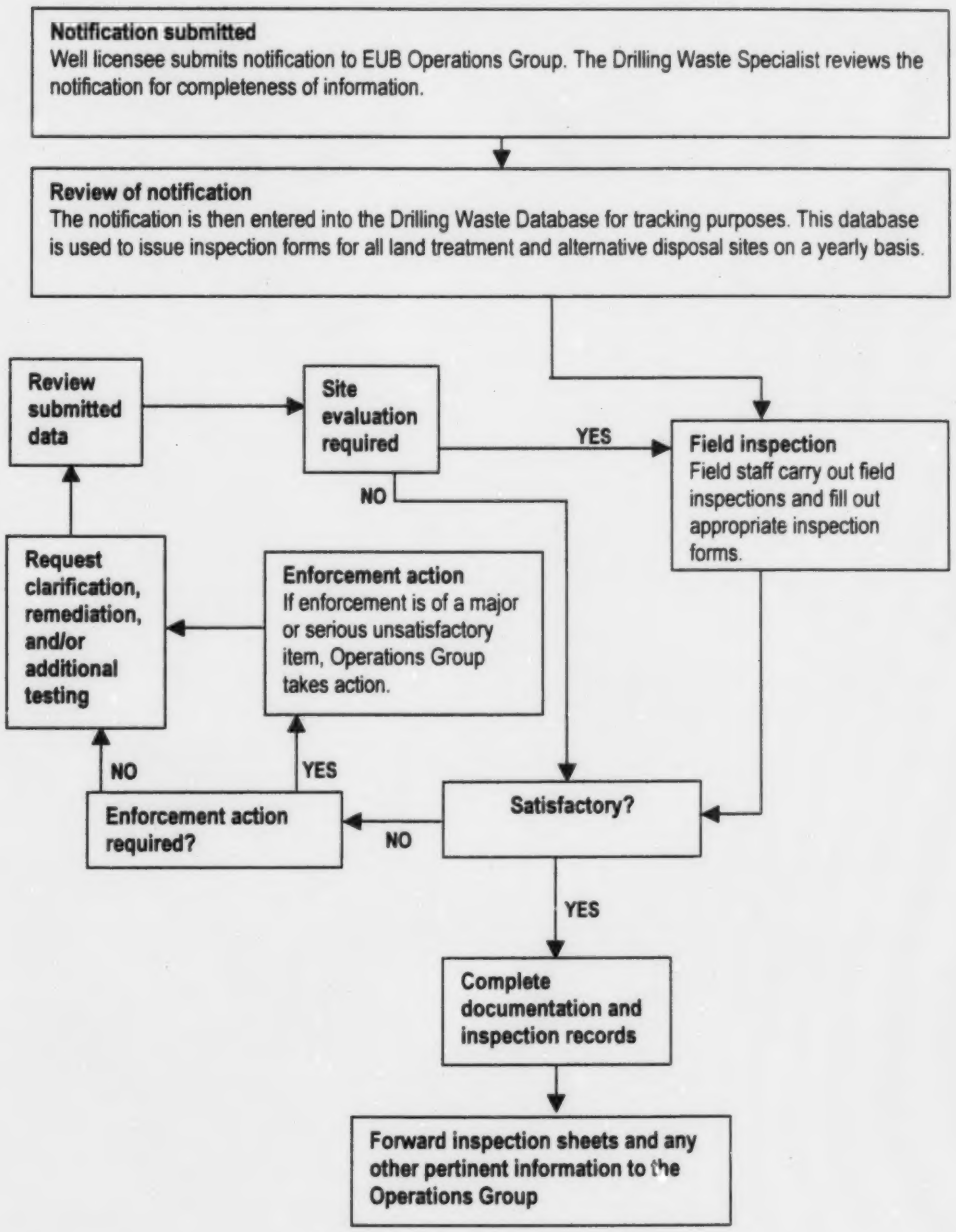
M 1. Analytical data required by *Guide 50* are incomplete, improper, or nonexistent.

M 2. QA/QC testing is incomplete or improper.

U 3. Inadequate testing of wastes for landspray while drilling disposal.

3 Nonroutine Drilling Waste Disposal Inspections

A nonroutine disposal is defined as any disposal that is approved in *Guide 50* and does require preapproval (e.g., those disposal options in Sections 5 and 6 of *Guide 50:* land treatment, biodegradation treatments, and alternative disposals). Flowchart 2 shows the inspection process for nonroutine disposals.


Notification submitted
Well licensee submits notification to EUB Operations Group. The Drilling Waste Specialist reviews the notification for completeness of information.
Review of notification
The notification is then entered into the Drilling Waste Database for tracking purposes. This database is used to issue inspection forms for all land treatment and alternative disposal sites on a yearly basis.
Review submitted data
Site evaluation required
YES
NO
Field inspection
Field staff carry out field inspections and fill out appropriate inspection forms.
Request clarification, remediation, and/or additional testing
Enforcement action
If enforcement is of a major or serious unsatisfactory item, Operations Group takes action.
NO
YES
Enforcement action required?
NO
Satisfactory?
YES
Complete documentation and inspection records
Forward inspection sheets and any other pertinent information to the Operations Group

Flowchart 2. Field Surveillance Inspection Process—Nonroutine Disposals

3.1 Preliminary Review—Nonroutine Disposals

Nonroutine disposals include land treatment, biocells, biopiles, alternative disposal options (pilot projects, unapproved mud systems for landspray while drilling, and disposal to oilfield waste facilities or landfills). The majority of these mud systems are either hydrocarbon or salt-based drilling fluids.

Nonroutine disposals generally require approval from the EUB Operations Group prior to disposal. Therefore, the well licensee must forward the prenotification to the Operations Group regardless of jurisdiction. If a Field Centre receives the prenotification in error, it should forward a copy of the form to the Operations Group in Calgary.

Upon receiving the submitted notification forms and associated disposal plans for any disposals that fall under Sections 5 and 6 of *Guide 50,* the Drilling Waste Specialist attached to the Operations Group conducts a preliminary review.

The Drilling Waste Specialist reviews the submitted notification form to ensure that the following information is given:

- well licensee
- well licence number
- bottomhole location and disposal location
- intended method of disposal
- volume anticipated
- mud type
- service company conducting disposal

If any of this information is missing, EUB staff will contact the well licensee and request the missing information. If all of the information is given, staff will conduct a detailed review of the submitted disposal plan.

3.2 Detailed Review—Nonroutine Disposals

The detailed review conducted by the Drilling Waste Specialist attached to the Operations Group looks at site-specific concerns and waste issues. This usually entails a close examination of the submitted disposal plan to ensure compliance with *Guide 50.* A disposal plan is required as per Section 5 of *Guide 50,* if the disposal involves the application of any hydrocarbon-based material to the land for the purpose of treatment.

3.2.1 How to Conduct a Detailed Review

The Drilling Waste Specialist reviews the disposal plan to ensure that

- it is in compliance with *Guide 50,* Sections 5 and 6
- the soil/waste mix has no more than 3 per cent oil content
- the potential end EC and SAR levels mean that the site can achieve reclamation standards
- the area used is not extensive
- an appropriate water management system exists (berm or collection pond)
- appropriate site selection, landowner, and potential public concerns are dealt with

Operations Group staff contact the respective Field Centre for comments regarding potential landowner and public concerns. Field Centre comments should be made prior to approval of any treatment activity.

Once the above criteria are determined to be appropriately addressed, staff review the monitoring section of the disposal plan. Ongoing monitoring of these sites is required until the site has reached closure criteria as defined in *Guide 50*, Section 5: Land Treatment.

3.2.2 Tracking of Nonroutine Disposals: Land Treatments and Biodegradations

Upon completion of the detailed review, the Operations Group tracks the proposed non-routine disposal, as described in the following process:

- Information from the prenotification is entered on the biodegradation spreadsheet (maintained by the Operations Group) for tracking purposes on a provincial basis. All notifications are recorded, regardless of jurisdiction.

- For disposals that require ongoing monitoring and management, information is transferred to the Biodegradation/Landtreatment Access database (maintained by the Operations Group). Key information from the disposal plan is also added to this database. The Operations Group keeps a hard copy of the disposal plan on file for future reference and makes it available to the Field Centres upon request. Staff forward updated information to the Field Centres for inspection purposes each spring. This updated information includes a record of contact with the well licensee and any previous field observations. In turn, the Field Centre sends a copy of the completed inspection form to the Operations Group for database updating purposes.

3.3 Field Inspection—Nonroutine Disposals

3.3.1 When to Conduct a Field Inspection

Once a site is entered into the Biodegradation/Landtreatment Access database, the appropriate EUB field inspectors inspect the treatment location. This is coordinated between the Operations Group and the Field Centres.

Once a year, usually in April, the Operations Group provides a complete list of all of the biodegradation/land treatment locations to each Field Centre. The list includes the following information regarding each location:

- last field inspection date, and a copy of the last field inspection report
- well licensee and service company
- copy of any correspondence relating to the site
- status of the site (i.e., closed or active)
- last inspection status (i.e., satisfactory or unsatisfactory)
- any other relevant information that may aid in an inspection

The field inspector reviews the list, noting which sites meet any of the following criteria and therefore are to be inspected that year:

- The site received an unsatisfactory inspection the previous year.
- The site has not been inspected in the last two years.
- The field inspector has some concerns with the location.
- A public complaint has been received about a location.

The number of sites inspected is subject to field personnel priorities and available staff dedicated to drilling waste disposal. The goal is to have a site inspected every two years until that site has reached closure, as prescribed in *Guide 50*, Section 5.

3.3.2 Who Conducts a Field Inspection

Any EUB field inspector who has undergone the appropriate training or has greater than five years' inspection experience may conduct a drilling waste disposal field inspection. The appropriate training consists of the field inspector having attended the EUB Field Training School and having gone out to at least three drilling waste disposal sites with a senior field inspector.

3.3.3 How to Conduct a Field Inspection

Physical inspection of the drilling waste disposal location, storage location, and/or disposal operations is conducted and the Drilling Waste Disposal Inspection Form—Nonroutine is completed. See Section 3.4 for instructions on completing this form.

During the field inspection, the field inspector must have a copy of this *Guide 70* and *Guide 50*, as well as any other pertinent EUB documents. The field inspection may include a visual inspection of

- sumps on site and associated remote sumps,
- pump-off areas,
- land treatment/biopile spread areas and any remote treatment locations, or
- mud storage areas.

The inspector must record any noted problems, including any deficiencies, on the nonroutine disposal inspection form. Each unsatisfactory item must be noted in the most appropriate place rather than in two or more places. Section 3.4 provides detailed instructions on how to complete the nonroutine disposal inspection form.

The Drilling Waste Disposal Inspection Form is used as a written record of every inspection item examined. In addition, the inspector must ensure that the inspection is entered on any required tracking sheets, in accordance with Field Centre protocols. Upon completion of the field inspection, the field inspector returns to the Field Centre to compile and review the site visit findings. The updated information should include a record of contact with the well licensee and any previous field observations.

The field inspector indicates on the inspection form all follow-up actions expected of the Operations Group and all noncompliances associated with the particular site. The Operations Group takes the information provided by the field inspector and enters the inspection results into the Biodegradation/Landtreatment Access database. The Operations Group then conducts all follow-up actions requested by the field inspector. This may range from gathering further information from the well licensee to notifying the well licensee of enforcement actions in writing.

3.3.4 Field Inspection Closure

Once the inspector completes the inspection form, following Section 3.4, the results of the field inspection are compiled and all noncompliance items are noted. Section 35: Nonroutine Disposal Inspection Operational Deficiencies identifies potential noncompliance items.

A field inspection is considered satisfactory if

- there are no outstanding noncompliance issues, as identified in Section 35;
- all *Guide 50* criteria have been adhered to;
- there is no obvious sign of contamination on site or off site; and
- all requested information has been received and additional clarification is not required.

If the field inspection uncovers noncompliance issues, enforcement action is implemented in accordance with the field surveillance enforcement ladders in *IL 99-4* (Appendix 1). The Operations Group coordinates enforcement of any nonroutine disposal, notifying the appropriate Field Centre of the enforcement actions for tracking purposes.

If the noncompliance appears to be a widespread issue for a well licensee (i.e., of provincewide concern) or extremely serious, the inspector may recommend that the Operations Group conduct an audit. This may include a thorough review of the notification form and well file information or it may incorporate a review of company waste management practices. If an audit is undertaken, the Operations Group will notify the appropriate Field Centre and send it copies of all correspondence.

When all of the field inspections for a given Field Centre are completed, the field inspector forwards all the completed inspection forms back to the Operations Group in one package, usually in December of the same year that the list was provided. At this point, the field inspection is considered closed by the Field Centres, and the Operations Group is responsible for any follow-up items or enforcement actions. The field inspector may be requested by the Operations Group to revisit the site if any corrective actions were ordered as part of an enforcement action to ensure that they were carried out as required.

3.3.5 Closure of a Land Treatment or Biodegradation Site

Once closure criteria as defined in *Guide 50*, Section 5, have been achieved, the well licensee must notify the Operations Group. Through a letter of closure, the well licensee will be advised that no further monitoring/treatment is required by the EUB. The status of the site will be changed to reflect the closed status of that site on the Biodegradation/ Landtreatment Access database.

The well licensee will be encouraged to continue monitoring the site for revegetation and apply for a reclamation certificate from Alberta Environment. A satisfactory field inspection is required and a copy of the final analysis will be requested before the site is removed from the active treatment sites list.

3.4 Completing the Drilling Waste Disposal Inspection Form—Nonroutine

Note that the inspection form is in abbreviated format: each item on the form may require several things to be inspected. Also note that the nonroutine disposal inspection form covers the disposals that fall under Sections 5 and 6 of *Guide 50* and only the items specific to the disposal option being checked should be filled out. Do not check a box for any item that has not been inspected.

The nonroutine disposal inspection form provided to the field inspector by the Operations Group has certain information already filled in from the Biodegradation/Landtreatment Access database. Prior to conducting the field inspection, field inspectors should review the inspection form and check fields already filled in (i.e., parts A through D) for accuracy; report any discrepancies and changes in the Comments section.

The field inspector completes Parts E, F, G, and Comments based on the site inspection.

Drilling Waste Disposal Inspection Form—Nonroutine

Landtreatment Site Information

A. Company Information

Company:
Contact:
Phone: Fax:

Well Licence:
Database ID Number:

B. Well Information

Surface Location:
Bottom Hole Location:
Remote Sump (yes/no):
Well Jurisdiction:

Remote Location:
Area Office:

C. Disposal Information

Disposal Type:
Treatment Location:
Treatment Jurisdiction:
Treatment Zone

Start Date:
Last Inspection:
Complete:

D. Environmental Company

Company:
Phone Number:

Contact:

E. Type of Inspection

☐ Initial ☐ Complaint
☐ Follow-up ☐ Audit

F. Operation at Time of Inspection

☐ Storage Prior to Treatment ☐ Check for Closure
☐ Treatment Started

G. Site Inspection Results

(Code: Satisfactory "X", Minor "U", Major "M", Serious " S")

1. ☐ Run-off Control
2. ☐ Fluid Disposal
3. ☐ Overall Material Storage
4. ☐ Evidence of Treatment
5. ☐ Hydrocarbon Odour
6. ☐ Visible Hydrocarbon
7. ☐ Site Security
8. ☐ Signage
9. ☐ Foreign Materials
10. ☐ Vegetation/Regrowth

Overall Inspection Results

11. ☐ Satisfactory Inspection
12. ☐ Unsatisfactory Inspection

Consequences/Follow-up (Code: Yes "Y" , No "N")

13. ☐ Follow-up (Field)
14. ☐ Enforcement Action
15. ☐ Change to Closed Status
16. ☐ Follow-up (Calgary)

REMARKS AND COMMENTS

Inspector Name _____ Date of Inspection _____

ENFORCEMENT ACTIONS REQUIRED

Minor Level 1
- Local company representative instructed to take corrective action.
- Company must confirm corrective action (**verbally or in writing**) to EUB field centre.
- Maximum time to take corrective action is 30 days.

Minor Level 2
- Local company representative instructed to take corrective action.
- Senior company representative with provincial authority must provide in writing to EUB field centre an explanation of why EUB directive not followed and an acceptable action plan for following EUB directives in the future.
- Maximum time to take corrective action is 15 days.

Minor Level 3
- Full or partial suspension of operations.
- Local company representative instructed to take corrective action.
- Senior company representative with provincial authority must provide in writing to EUB field centre an explanation of why EUB directive not followed and an acceptable action plan for following EUB directives in the future.
- Suspension remains in effect until noncompliance is remedied, a documented meeting/discussion is held with senior company representative with provincial authority, and the EUB removes suspension **in writing**.
- Noncompliance added to Corporate Data Information System.

Minor Level 4
- Immediate suspension (full or partial).
- Suspension remains in effect until documented meeting with senior company representative with provincial authority (VP/Pres).
- Senior company representative with provincial authority confirms compliance at this and all similar facilities in this inspection category.
- Senior company representative with provincial authority must provide a written acceptable action plan, including examination of cause and future prevention plans at this and all similar facilities.
- EUB Corporate Compliance may issue closure order, miscellaneous order, and/or refer status for future applications.

Major Level 2
- Temporary suspension, when safe to do so, may occur (full or partial) to correct deficiency or alleviate impact or potential impact.
- Local company representative instructed to take corrective action.
- Senior company representative with provincial authority must provide in writing to EUB field centre an explanation why EUB directive not followed and an acceptable action plan for following EUB directives in the future.
- Company has 30 days to correct operations in same inspection category on a provincial basis.

Major Level 3
- Same as Minor Level 3.
- Company has 15 days to correct operations in same inspection category on a provincial basis.

Major Level 4
- Same as Minor Level 4.

Serious Level 3
- Full or partial suspension of operations when safe to do so.
- Company instructed to take corrective action.
- Company must explain why event occurred, provide written acceptable action plan, and ensure that issue/event does not reoccur.
- Company must confirm that this and all similar facilities are in compliance.
- Operations remain suspended until noncompliance remedied, EUB accepts action plan, and written approval is received from EUB to resume operations.
- Noncompliance added to Corporate Data Information System.

Serious Level 4
- Same as Major Level 4.

Note: The above listed enforcement action items are summarized from the EUB Field Surveillance Enforcement Ladder in *Informational Letter (IL) 99-4*. Please refer to this IL or contact the local EUB field centre for further details. The EUB reserves the right to escalate noncompliance issue(s) to any level should conditions warrant.

How to Complete the Drilling Waste Disposal Inspection Form—Nonroutine

A Company Information

Check the following fields for accuracy: company name, well licence number, contact name, phone number, and fax number. In some cases treatment locations may be sold along with a particular well site. If this is the case, the well licensee information may have to be updated.

B Well Information

Check all of the well information for accuracy. Be sure that the signage on the location matches that on the inspection form. If the information does not match, note the discrepancies on the inspection form.

C Disposal Information

The disposal information indicates the type of disposal being inspected and the date it began. Sites should be closed within five years of the start date. The last inspection date is also included in this field.

D Environmental Company

This section may need updating from year to year, as the well licensee might engage different consultants. Confirm the name of the environmental company conducting the work at the treatment location at the time of inspection.

E Type of Inspection

Indicate why the inspection is being carried out by checking the type of inspection being conducted:

Initial — An initial inspection may occur during the drilling stage or when treatment has started. The stage of the process affects the specific criteria to be met.

Follow-up — Once treatment has started, a follow-up inspection may be part of a yearly check of the site. A follow-up may also occur to ensure that the well licensee performed an action previously directed by a field inspector.

Complaint — A complaint inspection is conducted in response to a complaint.

Audit — An audit inspection is in response to a direct request from the Operations Group.

F Operation at Time of Inspection

Indicate the type of activity occurring at the treatment location at the time of the site visit:

Storage prior to inspection — Occurs during or after drilling. Material may be stored prior to or after the hole is drilled but not laid out in the treatment area. Treatment has not started.

Treatment started — Treatment of the material has started.

Check for closure — The site is being checked for satisfactory closure and a release from management responsibilities.

G Site Inspection Results

For each item inspected as treatment activities are observed, mark "X" for satisfactory, "U" for minor unsatisfactory, "M" for major unsatisfactory, or "S" for serious unsatisfactory.

1 Runoff control

Runoff control is present on all sites and at all stages during storage and treatment. Water does not drain freely from the site, unless the well licensee has demonstrated that the runoff material meets the surface run-on/runoff criteria of *Guide 58* and shows a minimum of three consistent nontoxic responses to microtox.

- Runoff control may consist of diking, berms, or collection pits.

2 Fluid disposal

If a collection pit is on site, the water may be reapplied to the site or pumped off if it meets surface run-on/runoff criteria of *Guide 58* and shows a consistent nontoxic response to microtox.

If excess fluids develop on the site causing the treatment site to be under water, the excess fluids are being removed from the treatment site and disposed of in accordance with *Guide 58* criteria.

3 Overall material storage

During the drilling process and prior to treatment or disposal, *Guide 55* storage guidelines are adhered to.

- The EUB recommends that oil-based drilling waste be stored in lined pits, lined area on surface, or tanks.
- The use of earthen pits is not recommended.
- Treatment should be initiated or the material disposed of within six months of the finished drilling date, unless long-term storage criteria, as per *Guide 55*, have been addressed. This may be dependent upon location, weather, and access.

4 Evidence of treatment	The site is treated at least once a year. • The site must be inspected at least once a year for evidence of treatment, including disking, weed control, water removal, and fertilizer treatments.
5 Hydrocarbon odour	There is excessive hydrocarbon odour. • Both the surface and subsurface soils should be inspected for hydrocarbon odour.
6 Visible hydrocarbon	There is no visible hydrocarbon or staining. • Treatment must address hydrocarbon both on surface and subsurface.
7 Site security	Open pits are fenced to prevent access of both people and animals.
8 Signage	The treatment site has signage giving the name of the well licensee, the well location, and emergency phone numbers.
9 Foreign materials	The treatment area does not have any garbage, cement returns, liners, or other foreign items present. Weed growth is monitored, controls are conducted during treatment, and garbage is removed from the site.
10 Vegetation/regrowth	The well licensee has initiated revegetation prior to closure to ensure that there will be sufficient growth over the entire treatment area. • Bare patches indicate poor sampling techniques.

Overall Inspection Results

11 Satisfactory	If the site is determined to be satisfactory (i.e., has no noncompliance items), mark this box with an "X".
12 Unsatisfactory	If the site is determined to be unsatisfactory (i.e., has noncompliance items), mark this box depending on the highest level of noncompliance. For a minor noncompliance, enter "U", for a major an "M", and for a serious, an "S" in this box.

Consequences/Follow-up

13 Follow-up (Field Centre)	Enter "Y" (yes) if the field inspector will follow up on any identified noncompliance.
14 Enforcement action	Enter "Y" (yes) if there are any identified noncompliance items.
15 Change to closed status	Enter "Y" (yes) if the site has reached closure criteria as defined in *Guide 50*, Section 5.

16 Follow-up (Operations Group)	Enter "Y" (yes) if the Operations Group is required to follow up on any identified noncompliance.
Remarks and Comments	Note any unusual site conditions. Give written instructions that identify noncompliance items, expected action, and the deadline date for compliance.
Inspector's Name	Enter the inspector's name, phone number, and fax number, including area codes.
Submission of Form	Send one copy of the completed form to the Operations Group in Calgary.

3.5 Nonroutine Disposal Inspection Operational Deficiencies

The **level** of each deficiency is based on the criteria set out in *IL 99-4* (Appendix 1).

Definitions of Unsatisfactory Inspections

- **Minor unsatisfactory event/inspection (U)** — a contravention of regulation(s) or requirement(s) that does not result in a direct threat to the public or the environment and does not adversely affect oil and gas operations.
- **Major unsatisfactory event/inspection (M)** — a contravention of regulation(s) or requirement(s) that an operator has failed to address or that has the potential to cause an adverse impact on the public or the environment.
- **Serious unsatisfactory event/inspection (S)** — a total disregard for regulation(s) or requirement(s) that is having or may have a significant impact on the public or the environment.

The EUB may escalate noncompliance issue(s) to any level should conditions warrant.

Compliance and Noncompliance Results

Inspection results are rated "X" - satisfactory, "U" - minor unsatisfactory, "M" - major unsatisfactory, or "S" - serious unsatisfactory. Items below are numbered in accordance with the Drilling Waste Disposal Inspection Form—Nonroutine.

G Site inspection results

1. Runoff control

M 1. There is no runoff control.

2. Fluid disposal

U 1. Excess fluids on the treatment site; the site is under water.

M 2. Evidence of fluid migration causing adverse impact to vegetation/environment. May escalate based on impact and/or well licensee's disposal management.

3. Overall material storage

M 1. Stored directly on surface or in unlined pit.

M 2. Material stored for over six months when access and weather have permitted treatment. Treatment must commence within six months of rig release date.

4. Evidence of treatment

U 1. There is no evidence of treatment activity during the season (April-October) or no evidence of work completed since the previous site visit.

U 2. No site analysis conducted for over one year.

5. Hydrocarbon odour

U 1. Significant hydrocarbon odour is present. Confirm level of hydrocarbon content.

6. Visible hydrocarbon

U 1. Visible hydrocarbon is evident.

7. Site security

U 1. There is a potential hazard for people or animals.

8. Signage

U 1. No signage is present.

9. Foreign materials

U 1. Garbage, cement returns, sump liners, or other foreign (inert) wastes are incorporated into treatment area.

U 2. Weeds are not controlled.

10. Vegetation/regrowth

U 1. Limited or no growth has occurred and closure has been applied for.

Appendix 1 Informational Letter (IL) 99-4: EUB Field Surveillance Enforcement Process and Ladder

8 June 1999

To: All Operators and Companies Regulated by the EUB

EUB ENFORCEMENT PROCESS,
GENERIC ENFORCEMENT LADDER, AND
FIELD SURVEILLANCE ENFORCEMENT LADDER

INTRODUCTION

The EUB has adopted an enforcement process, which establishes guidelines for EUB enforcement actions when dealing with regulatory non-compliance. Implementation of this enforcement process together with surveillance activities will safeguard the integrity of the EUB's other core functions; Adjudication and Regulation, Applications, and Information and Knowledge.

Initial enforcement is determined by the severity of the non-compliance and is escalated for repeated non-compliance or failure to respond. No new regulations are proposed. This enforcement process will:

- improve EUB staff consistency, efficiency, and effectiveness
- result in increased public safety, minimize environmental impacts, and improve conservation
- help create a level regulatory playing field for industry, and
- improve EUB and industry accountability.

Companies failing to meet requirements or follow EUB direction will be subject to escalating enforcement consequences. The required response to EUB direction and subsequent continued compliance with regulations will result in the company's compliance status reverting back to satisfactory. ***Therefore, it is imperative that all companies regulated by the EUB fully understand enforcement consequences and have internal corporate processes in place to ensure that EUB regulatory compliance requests are acted upon.***

ENFORCEMENT LADDERS

Attached are two new enforcement ladders, which detail the new EUB enforcement process. These ladders consist of three categories for initial non-compliance items – Minor, (lowest), Major, and Serious (highest). EUB staff will defer to the lower category if in doubt about where to rate a non-compliance event. The steps within the Enforcement Ladders represent an initial consequence and subsequent escalation for repeat regulatory non-compliance or failure to respond to EUB regulatory compliance requests.

The first is a Generic Enforcement Ladder designed to:

- guide EUB enforcement actions (after 1 August 1999) in situations where there is no specific ladder in place, and
- provide a foundation and framework to develop specific EUB enforcement ladders as required.

The second is a Field Surveillance Enforcement Ladder, focusing on field inspections of upstream oil and gas operations. The Field Surveillance Enforcement Ladder will be implemented on 1 August 1999 and the EUB will continue to update field inspection manuals to better define Minor, Major, and Serious items.

POLICY

The EUB will not normally apply additional enforcement consequences when a company voluntarily identifies a non-compliance issue/event to the EUB and is employing the proper resources and effort to remedy the problem. However, the EUB reserves the right to escalate non-compliance issue(s) to any level should conditions warrant. Companies that do not agree with expectations or consequences outlined by an EUB staff member must initially contact that staff member for resolution. If a resolution cannot be achieved, the company can contact the Enforcement Advisor of the EUB's Corporate Compliance Group. Additionally, any affected party may apply for a hearing.

This Informational Letter is consistent with the EUB's commitment to reduce unnecessary requirements, and to actively enforce those requirements considered necessary. The EUB will formally review and make necessary changes to these ladders two years from the date of this Informational Letter. Additionally, the EUB will consult representatives from the Utilities and Coal industries regarding enforcement ladder design and implementation.

The EUB wishes to thank members of the public, CAPP, SEPAC, individual companies, and internal staff who contributed to the development of these ladders.

Questions regarding this Informational Letter should be directed to:

EUB Facilities Division
Corporate Compliance Group
640 - 5 Avenue SW
Calgary, Alberta T2P 3G4
(403) 297-4490 or 297-3531

Neil McCrank, Q.C.
Chairman
Attachments

IL 99-4—Clarification

February 24, 2000

To: All Operators and Companies Regulated by the EUB

EUB ENFORCEMENT PROCESS—CLARIFICATION

Purpose
This document summarizes and clarifies the specific conditions under which companies may move off of the EUB enforcement ladders from the various levels. Although this information is contained in the text of *IL 99-4: EUB Enforcement Process, Generic Enforcement Ladder and Field Surveillance Enforcement Ladder*, a number of questions have been raised respecting "How do I get off the enforcement ladder?" As a result, the EUB believes it is appropriate to provide this additional explanation.

Basic Principles
IL 99-4 describes the escalating enforcement ladder concept and the importance for companies to be compliant with requirements at all times. If a non-compliance does occur and the EUB places a company on an enforcement ladder, it is critical to the company that it meet specified conditions to get off of the enforcement ladder and stop the process of escalating enforcement. Once the company is off of the enforcement ladder, the EUB handles any subsequent non-compliance event as if it were the company's first such event.

Specific Conditions for Each Level to Get Off of the Enforcement Ladder
The following table outlines the original cause of being placed on a particular level and the corresponding conditions that must be met to move off of the enforcement ladders:

Cause of level-1 non-compliance	The following condition must be met to achieve compliance (i.e., to get off of the enforcement ladder)
Initial minor non-compliance	Remedy the original non-compliance issue

Causes of level-2 non-compliance		The following conditions must be met to achieve compliance (i.e., to get off of the enforcement ladder)
Failure to respond to level 1	Initial major non-compliance	
✓	✓	Remedy the original non-compliance issue
✓	✓	Identify the cause
✓	✓	Self-identification and remedy of similar non-compliant situations
✓	✓	Provide a prevention plan to the EUB work group
		AND (whichever occurs first)
	✓	3 consecutive inspections or audits with no major non-compliances in the same EUB work group or inspection category **OR**
	✓	12 months (from notification date of enforcement action) with no further major non-compliance in the same EUB work group or inspection category

Causes of level-3 non-compliance			The following conditions must be met to achieve compliance (i.e., to get off of the enforcement ladder)
Failure to respond to level 2	**Initial serious non-compliance**	**2nd major non-compliance**	
✓	✓	✓	Remedy the original non-compliance issue
✓	✓	✓	Identify the cause
✓	✓	✓	Self-identification and remedy of similar non-compliant situations
✓	✓	✓	Provide a prevention plan to the EUB work group
			AND (whichever occurs first)
	✓		12 months (from notification date of enforcement action) with no further serious non-compliance in the same EUB work group or inspection category **OR**
		✓	12 months (from notification date of enforcement action) with no further major or serious non-compliance in the same EUB work group or inspection area **OR**
		✓	3 consecutive inspections or audits with no major or serious non-compliances in the same EUB work group or inspection category

Causes of level-4 non-compliance		The following conditions must be met to achieve compliance (i.e., to get off of the enforcement ladder)
2nd serious non-compliance within 12 months	**Failure to respond to level 3**	
✓	✓	Remedy the original non-compliance issue
✓	✓	Satisfy the EUB work group that the non-compliance will not occur again if it initially was a major or serious non-compliance
✓	✓	Satisfy EUB Corporate Compliance that the company has determined and corrected the problem(s) within the company that resulted in the enforcement action being escalated to level 4 in order to achieve compliance
✓	✓	Satisfy EUB Corporate Compliance that the company fully understands enforcement consequences and has internal corporate processes in place to ensure that EUB regulatory compliance requests are acted upon within the given time frames
Note: A company at level 4 must meet both level 3 and 4 conditions to be completely off of the enforcement ladders (i.e., you move from Level 4 to Level 3 and off of the Enforcement Ladder).		

As previously stated, the EUB will formally review and make necessary changes to the ladders starting in July 2001. Please refer to *IL 99-4* or the EUB Web site at www.eub.gov.ab.ca under EUB Enforcement for further information.

Direct questions about this informational letter to
EUB Compliance and Operations Branch
Corporate Compliance Group
640 – 5 Avenue SW
Calgary, Alberta T2P 3G4
(403) 297-4490 or (403) 297-3531

Neil McCrank
Chairman

IL 99-4 Field Surveillance Enforcement Ladder Attachment

EUB FIELD SURVEILLANCE ENFORCEMENT LADDER FOR INDUSTRY NON-COMPLIANCE

Licensees and/or operators of wells/facilities/pipelines in Alberta are responsible to ensure their operations are conducted in accordance with all provincial requirements. However, in certain situations, enforcement of regulations where non-compliance takes place will be required.

One of the core business functions of the Energy and Utilities Board (EUB) is to maintain and enhance a surveillance and enforcement process that ensures public safety, minimizes impacts to the environment and improves conservation of resources. This process is designed for all EUB stakeholders to ensure they are aware of and understand the Board's enforcement philosophy and consequences for non-compliance. The Board believes this process will assist in reducing non-compliance issues and creates lasting improvements.

The following enforcement consequences for non-compliance have been adopted by the EUB to ensure that regulatory requirements are met and operators are treated in a similar fashion. The consequences are based on an escalation of enforcement action that is timely, effective, and appropriate to the severity of the situation. The EUB inspection selection criteria is primarily based on operator performance, sensitivity of the area (environmental), and inherent risk (potential impact level). This process will ensure that operators with a non-compliant inspection history will be inspected on a more frequent basis than operators in good standing.

Consequences will only occur when operators fail to meet requirements and/or regulations and will not escalate to a higher severity unless the operator fails to address EUB requirements/ requests. The company's consequence level will revert back to satisfactory after 3 consecutive satisfactory inspections or a 12 month time period with no major unsatisfactory inspections in the same inspection category (e.g., oil, gas, drilling). Operators that inform the EUB of non-compliance will not normally be penalized and additional consequences will not be applied when a company is demonstrating that it is employing the proper resources and effort to remedy the problem.

The attached enforcement actions have been developed with the understanding that the EUB will do an extensive review of all existing inspection manuals to clearly define what constitutes a minor, major, or serious unsatisfactory inspection item(s). These definitions are outlined in the attached enforcement ladders.

Licensees and operators should contact the EUB Field Surveillance Group with any questions or concerns regarding EUB requirements, inspections, and/or enforcement actions.

THE EUB RESERVES THE RIGHT TO ESCALATE NON-COMPLIANCE ISSUE(S) TO ANY LEVEL SHOULD CONDITIONS WARRANT.

Minor Non-Compliance Issue/Item

A minor unsatisfactory event/inspection is defined as a contravention of regulation(s)/requirement(s) which does not result in a direct threat to the public and/or the environment and does not adversely effect oil and gas operations. Examples of minor non-compliance are:

- well/facility/pipeline identification sign(s) are not posted or are inadequate
- valve handle(s) missing on kill or bleed off line
- oil or salt water staining on lease
- required calibration tag not attached to measurement device

Minor Non-Compliance Enforcement Ladder

Inspection Result	Action	Communication
Level One		
Initial minor unsatisfactory item or inspection result.	• Company instructed to take corrective action at a specific location(s) and/or operation(s). • Company instructed to confirm corrective action (verbally or in writing).	• EUB Field Centre staff provides instructions and/or copy inspection form/letter to local company representative. • The written communication must confirm non-compliance item(s), expected action, deadline date, and consequences for future non-compliance (see Level Two). • EUB Field Centre staff must notify impacted residents of event and resolution(s).
• The EUB will not normally schedule reinspection of wells/facilities/pipelines where minor non-compliance items were noted. It will, however, monitor operator performance on a provincial basis and will escalate consequences for persistent minor non-compliance. • The EUB will take the appropriate on-site action for future non-compliance at this facility but will not escalate consequences to Level Two for 30 days after the company has been instructed to take corrective action.		
Level Two		
Failure to take action required in Level One	• Company instructed to take corrective action. • Company must explain why EUB directive not followed and provide written acceptable action plan, which ensures EUB directives are followed in the future.	• EUB Field Centre staff with Team Leader approval provides written instructions to local company representative. • EUB Field Centre staff sends letter to senior company representative with provincial authority confirming non-compliance item(s), expected action, inspection history, deadline date, and consequences for future non-compliance (see Level Three). • EUB Field Centre staff must notify impacted residents of event and resolution(s).
• The EUB will take the appropriate on-site action but will not escalate to Level Three until 15 days after sending letter to senior company representative with provincial authority.		

Minor Non-Compliance Enforcement Ladder (cont'd)

Inspection Result	Action	Communication
Level Three		
Failure to take action required in Level Two.	• Full or partial suspension of operations when safe to do so. See next page for criteria. • Company instructed to take corrective action. • Company must explain why EUB directive not followed and provide written acceptable action plan, which ensures EUB directives are followed in the future. • Operations will remain suspended until non-compliance is remedied, EUB accepts written action plan, and written approval is received from Field Centre staff. • Operations will also remain suspended until such time as a documented meeting/discussion with senior company representative with provincial authority (VP/Pres) is held. • Add the non-compliance event to the EUB Corporate Data Information System (CDIS).	• EUB Field Centre staff with Team Leader approval provides written instructions to local/on-site company representative to suspend operations (full or partial). • Notification to EUB Division Leader and Board of controversial situations or large impact to the company or potential for media coverage. • EUB Field Centre staff with Team Leader approval sends a letter to senior company representative with provincial authority confirming inspection history, non-compliance item(s), on-site action taken, further expectations/deadline date, and escalating consequences for future non-compliance (see Level Four). • EUB Field Centre staff advises Field Surveillance Management Team and Corporate Compliance Group. • EUB Field Centre staff must notify impacted residents of event and resolution(s).
Level Four		
Failure to take action required in Level Three	• Immediate suspension (full or partial) of operations when safe to do so. • Corporate Compliance requested to take appropriate enforcement action, which could include closure order for suspension or miscellaneous order and "refer status" for future applications. • Suspension will remain in effect until documented meeting with senior company representative with provincial authority (VP/Pres) is held. • Company also confirms compliance at this and all similar facilities and submits a written acceptable action plan including examination of cause and future prevention plans and commitments.	• EUB Field Centre staff with Team Leader approval provides written instructions to local/on-site company representative to suspend operations (full or partial). • EUB Field Centre staff advises Field Surveillance Management Team, Corporate Compliance Group, and Board of suspension. • EUB Field Centre staff and Corporate Compliance send letter and closure order to senior company representative with provincial authority confirming the non-compliance history and on-site action required. • EUB Field Centre staff must notify impacted residents of event and resolution(s).

Persistent Non-Compliance

Companies that clearly exceed the minor unsatisfactory industry average as evidenced from EUB inspection statistics will be dealt with by the EUB Provincial Coordinator for that inspection category (e.g., oil, gas, drilling). A letter will be sent requiring the company to submit a written acceptable action plan, including examination of cause and future prevention plans and commitments. This letter will also outline future expectations and deadline date. Should future EUB inspections indicate that the company has failed in their commitments, consequences may be elevated to third party inspections at the company's expense and/or full or partial suspensions as directed by the EUB.

These definitions apply to Minor Non-Compliance only:

The EUB staff will determine which wells or portions of facilities that are to be suspended.

1) Partial Facility Suspension

Facility Production
Hydrocarbon liquids (or gas equivalent)
$<50m^3$/day = Full Suspension
$>50m^3$/day = 25 per cent Suspension

2) Full Facility Suspension

Facility can produce only sufficient fuel gas for heating purposes.

Major Non-Compliance Issue/Item

A major unsatisfactory event/inspection is defined as a contravention of regulation(s)/requirements(s) that an operator has failed to address and/or has the potential to cause an adverse impact on the public and/or the environment. Examples of major non-compliance are:

- blowout preventer failed to operate properly
- tank vapour recovery unit not functional allowing H_2S to vent
- unaddressed spill on or off lease
- no crossing agreement on pipeline construction

Major Non-Compliance Enforcement Ladder

Inspection Result	Action	Communication
Level Two		
Initial major unsatisfactory item/inspection result	• Company instructed to take corrective action at subject site and ensure compliance at all similar facilities (e.g. wells, production facilities, and pipelines). • Temporary suspension of certain operations may be necessary to correct deficiencies and alleviate impact or potential impact. • Company must provide documented action plan to ensure issue/event does not reoccur.	• EUB Field Centre staff provides written instructions to local/on-site company representative. • EUB Field Centre staff with Team Leader approval sends letter to senior company representative with provincial authority confirming inspection history, non-compliance item (s), on-site action taken, expected future action, deadline date, and consequences for future non-compliance (see Level Three). • EUB Field Centre staff must notify impacted residents of event and resolution(s). • Notification to EUB Division Leader and Board of controversial situations or large impact to the company or potential for media attention.
• The EUB will take the appropriate on-site action for future non-compliance at this or other facilities but will not escalate consequences to Level Three on a provincial basis for 30 days after company instructed to take corrective action. • The company's consequence level will revert back to satisfactory after 3 consecutive satisfactory inspections or a 12-month time period with no major unsatisfactory inspections in the same inspection category (e.g., oil, gas, drilling).		
Inspection Result	**Action**	**Communication**
Level Three		
Failure to take action required in Level Two and/or a second major non-compliance in the same inspection category on a provincial basis.	• Full or partial suspension of operations to alleviate impact or potential impact when safe to do so. • Company instructed to take corrective action. • Company must explain why EUB directive not followed and provide written acceptable action plan, which ensures EUB directives are followed in the future. • Company also confirms in writing that this and all similar facilities are in compliance. • Operations will remain suspended until non-compliance is remedied, EUB accepts written action plan, and written approval is received from Field Centre staff. • Operations will also remain suspended until such time as a documented meeting/discussion with senior company representative with provincial authority (VP/Pres) is held. • Add the non-compliance event to the EUB Corporate Data Information System (CDIS).	• EUB Field Centre staff with Team Leader approval provides written instructions to local/on-site company representative to suspend operations (full or partial). • Notification to EUB Division Leader and Board of controversial situations or large impact to the company or potential for media coverage. • EUB Field Centre staff with Team Leader approval sends a letter to senior company representative with provincial authority confirming inspection history, non-compliance item(s), on-site action taken, further expectations/deadline date, and escalating consequences for future non-compliance (see Level Four). • EUB Field Centre staff advises Field Surveillance Management Team and Corporate Compliance Group. • EUB Field Centre staff must notify impacted residents of event and resolution(s).
• The EUB will take the appropriate on-site action for future non-compliance at this or other facilities but will not escalate consequences to Level Four on a provincial basis until 15 days after sending letter to/or holding a documented meeting with senior company representative with provincial authority. • The company's consequence level will revert back to satisfactory after 3 consecutive satisfactory inspections or a 12-month time period with no major unsatisfactory inspections in the same inspection category (e.g., oil, gas, drilling).		

(cont'd)

Major Non-Compliance Enforcement Ladder (cont'd)

Inspection Result	Action	Communication
Level Four		
Failure to take action required in Level Three and/or a third major non-compliance in the same inspection category on a provincial basis.	• Immediate suspension (full or partial) of operations to alleviate issue when safe to do so. • Corporate Compliance requested to take appropriate enforcement action, which could include closure order for suspension or miscellaneous order and "refer status" for future applications. • Suspension will also remain in effect until documented meeting with senior company representative with provincial authority (VP/Pres) is held. • Company also confirms compliance at this and all similar facilities and submits a written acceptable action plan including examination of cause and future prevention plans and commitments.	• EUB Field Centre staff with Team Leader approval provides written instructions to local/on-site company representative to suspend operations (full or partial). • EUB Field Centre staff advises Field Surveillance Management Team, Corporate Compliance Group, and Board of suspension. • EUB Field Centre and Corporate Compliance send letter and closure order to senior company representative with provincial authority confirming the non-compliance history and on-site action required. EUB Field Centre staff must notify impacted residents of event and resolution(s).

Serious Non-Compliance Issue/Item

A serious unsatisfactory event/inspection is defined as a total disregard for regulation(s)/requirement(s) that is causing or may cause a significant impact on the public and/or environment. Examples of serious non-compliance are:

- blowout preventer(s) missing
- unaddressed spill into water, operator aware, no action is being taken
- conducting an activity without an approval and/or licence where required
- H_2S odour present, operator aware, no action is being taken

Serious Non-Compliance Enforcement Ladder

Inspection Result	Action	Communication
Level Three		
Initial serious non-compliance item.	• Full or partial suspension of operations to alleviate impact or potential impact when safe to do so. • Company instructed to take corrective action. • Company must explain why event occurred, provide written acceptable action plan, and ensure issue/event does not reoccur. • Company also confirms in writing that this and all similar facilities are in compliance. • Operations will remain suspended until non-compliance remedied, EUB accepts written action plan, and written approval is received from EUB Field Centre Staff. • Operations will also remain suspended until such time as a documented meeting/discussion with senior company representative with provincial authority (VP/Pres) is held. • Add the non-compliance event to the EUB Corporate Data Information System (CDIS).	• EUB Field Centre staff with Team Leader approval provides written instructions to local/on-site company representative to suspend operations (full or partial). • Notification to EUB Division Leader and Board of controversial situations or large impact to the company or potential for media coverage. • EUB Field Centre staff with Team Leader approval sends a letter to senior company representative with provincial authority confirming inspection history, non-compliance item(s), on-site action taken, further expectations/deadline date, and escalating consequences for future non-compliance (see Level Four). • EUB Field Centre staff advises Field Surveillance Management Team and Corporate Compliance Group. • EUB Field Centre staff must notify impacted residents of event and resolution(s).
• The company's consequence level will revert back to satisfactory after a 12-month time period of no major or serious unsatisfactory inspections in the same inspection category (e.g., oil, gas, drilling).		
Level Four		
Failure to take action required in Level Three and/or a second serious non-compliance in the same inspection category on a provincial basis.	• Immediate suspension (full or partial) of operations to alleviate issue when safe to do so. • Corporate Compliance requested to take appropriate enforcement action, which could include closure order for suspension or miscellaneous order and "refer status" for future applications. • Suspension will also remain in effect until documented meeting with senior company representative with provincial authority (VP/Pres) is held. • Company also confirms compliance at this and all similar facilities and submits a written acceptable action plan including examination of cause and future prevention plans and commitments.	• EUB Field Centre staff with Team Leader approval provides written instructions to local/on-site company representative to suspend operations (full or partial). • EUB Field Centre staff advises Field Surveillance Management Team, Corporate Compliance Group, and Board of suspension. • EUB Field Centre and Corporate Compliance Group send letter and closure order to senior company representative with provincial authority confirming the non-compliance history and on-site action required. • EUB Field Centre staff must notify impacted residents of event and resolution(s).

Summary of Terms

1) Closure Order
A legal document that formally orders the closure of a facility and prevents any further operations from occurring without EUB consent or until the order is rescinded. Issued by the EUB Enforcement Section of the Corporate Compliance Group in accordance with pertinent EUB-related Acts and Regulations.

2) Corporate Compliance Group
Provides EUB-wide enforcement services and support. Located within the Facilities Division of the EUB, consisting of three sections: Enforcement, Liability Management, and Corporate Audit.

3) Corporate Data Information System (CDIS)
CDIS is an internal data system, used to record both a company's corporate data (name, address, phone number, etc.) plus any high-level non-compliance issues involving the company.

4) Demonstrated Disregard
Company knows or should know about a major non-compliance issue/event, but does not act to remedy the issue/event.

5) Measurement
Measurement requirements where the Board has jurisdiction. This measurement may be of oil, gas, water, etc. These products must meet measurement guidelines including installation and calculation(s) of the volumes as per EUB requirements.

6) Miscellaneous Order
A legal document that formally orders a specific action other than closure or abandonment, i.e., clean-up of a spill. Issued by the EUB Enforcement Section of the Corporate Compliance Group with pertinent EUB related Acts and Regulations.

7) Refer Status
A corporate status indicator on the Corporate Data Information System (CDIS) which indicates a company's inability or unwillingness to comply. The status will be considered by the EUB when deciding to approve or deny future and pending applications by the company.

8) Same Inspection Category
Oil and gas operations in specific operating disciplines. Examples of these operating disciplines include drilling, servicing, oil production and processing facilities, gas production and processing as it relates to gas wells, gathering systems, and processing plants, pipelines and associated facilities, injection/disposal facilities, and oilfield waste facilities.

9) Senior Company Representative with Provincial Authority
A company representative who has authority to implement measures provincially on a company wide basis such as the Vice-President or President.

10) Total Disregard
Company knows or should know about a major non-compliance issue/event, but does not act to remedy the issue/event.

11) Unaddressed non-compliance
A non-compliance issue/event that a company is not actively addressing.

Appendix 2

Sample Completed Notification Forms

EUB Alberta Energy and Utilities Board

Notification of Drilling Waste Disposal

The licensee certifies that the information on this form is correct and is submitted to the appropriate regulatory agency 48 hours prior to drilling waste disposal.

DAY MONTH YEAR: LWD AND LANDSPRAY PG 1 OF 2

YOUR FILE NUMBER:

1. REGULATORY OFFICE

Appropriate regulatory office: PROPER AGENCY AND FIELD CENTRE — Fax:

Second regulatory office (if applicable): APPLICABLE IF WELL AND DISPOSAL SITE DIFF. JURISDICTION — Fax:

2. WELL INFORMATION

Well licensee: COMPANY NAME REQUIRED

Surface location: LE LSD SEC TWP RGE W M — REQUIRED

Well licence number: REQUIRED

Unique well identifier: SS LE LSD SEC TWP RGE W M P ES — REQUIRED

Mineral surface lease number (if applicable): REQUIRED IF APPLICABLE

Sump location or storage location: 1. Same as surface location / or REQUIRED IF NOT SAME AS SURFACE WELL LOCATION W___M

2. Same as surface location / or _____ W___M

Mud type: REQUIRED; FOR LWD MUST BE GEL CHEM, GYPSUM WATER (FLOC), OR NITRATE GYPSUM

Date of sampling: DAY MONTH YEAR — REQUIRED

Proposed date of disposal (48 hours notice is required): DAY MONTH YEAR — REQUIRED- LWD ACTUAL DATE IS ON POST DISPOSAL NOTIF

Operator/company contact: NAME REQUIRED, MUST BE OF ACTUAL OIL AND GAS COMPANY, NOT CONTRACTOR; COMPANY NAME REQUIRED; MOBILE; PHONE REQUIRED; FAX

Sampling company contact: NAME REQUIRED; COMPANY NAME; MOBILE; PHONE REQUIRED; FAX

If drilling wastes are to be disposed by land treatment or alternative disposal methods, attach the required documentation and provide a summary in Comments section on page 2.

3. ON-SITE DISPOSAL

Fluids vol ____m³ Solids vol ____m³ Total waste ____m³

Soil texture _____

LANDSPREADING ☐

Application thickness ____cm Incorporation depth ____cm

Receiving soil EC ____dS/m Receiving soil SAR ____

	Minimum area (ha)	Max. application rate (m³/ha)	Max. amount added (kg/ha)
Chloride			
Sodium			
Nitrogen			
TDS			

Toxicity pass: Y / N / NA _____ Predicted oil content after mix _____%

Proposed application rate _____ m³/ha

Proposed area used for disposal _____ ha

MIX – BURY – COVER ☐

Estimated water table depth _____m Intended mix ratio _____

Volume to be disposed _____ m³

Has site been used before? Y / N _____ Toxicity pass: Y / N / NA _____

Post-disposal values

Chloride _____mg/kg Oil _____%

Total mass chloride _____kg Total mass nitrogen _____kg

4. OFF-SITE DISPOSAL

Fluids vol YES m³ Solids vol NO m³ Total waste YES m³

Soil texture _____ Horizon thickness _____cm

LANDSPRAYING ☒ PUMP-OFF ☐ LWD ☒

Application thickness ____cm Incorporation depth ____cm (if applicable)

Receiving soil EC 2 OR LESS dS/m Receiving soil SAR 6 OR LESS

	Minimum area (ha)	Max. application rate (m³/ha)	Max. amount added (kg/ha)
Chloride	REQUIRED		
Sodium	REQUIRED		
Nitrogen	REQUIRED if	nitrogen added	
TDS	REQUIRED		

Solids loading rate LESS THAN 6 ON VEGETATED LAND t/ha

Toxicity pass: Y / N / NA MUST BE "Y" FOR LANDSPRAY, "NA" FOR LWD

Predicted oil content after mix <0.5% ALLOWED FOR LANDSPRAY ONLY, NOT LWD %

Proposed application rate <20 WINTER AND < 40 SUMMER m³/ha

Proposed area used for disposal MUST BE > MINIMUM REQUIRED AREAS ABOVE ha

Landowner REQUIRED

Phone REQUIRED

Date of consent REQUIRED

Landowner consent is required if the disposal is off site.

Horizontal oil well? Y / N REQUIRED **Hydrocarbons added? Y / N** REQUIRED **Salt zone encountered? Y / N** REQUIRED **Nitrogen >400 kg added? Y / N** REQUIRED

If you answer YES to any of the above questions, please give details in the Comments section on page 2.

WELL LICENCE NO. LWD AND LANDSPRAY PG 2 OF 2

Notification of Drilling Waste Disposal (page 2)

SS LE LSD SEC TWP RGE W M P ES

YOUR FILE NO. _____ UNIQUE WELL IDENTIFIER _____

5. DETAILED INFORMATION

Oversaturated solids, fluids, or total waste

As received sample

SG (meas)	#	
Mud density (calc)		kg/m³
DBD (calc)	#	kg/m³
Oil content (meas)	@	% dry wt.
Φ (calc)		

As received filtrate

pH (meas)		
EC (meas)	#	dS/m
TDS (calc)	#	mg/L
Chloride (meas)	#	mg/L
Sodium (meas)		mg/L
Nitrogen (meas)	N	mg/L
Calcium (meas)	#	mg/L
Magnesium (meas)		mg/L
SAR (calc)	#	

Undersaturated solids

As received sample

SG (meas)		
Mud density (calc)		kg/m³
DBD (calc)		kg/m³
Oil content (meas)		% dry wt.

Saturated paste

SG (meas)		
Φ_s (calc)		

Saturated paste extract

pH (meas)		
EC (meas)		dS/m
TDS (calc)		mg/L
Chloride (meas)		mg/L
Sodium (meas)		mg/L
Nitrogen (meas)		mg/L
Calcium (meas)		mg/L
Magnesium (meas)		mg/L
SAR (calc)		

Clear liquids

As received sample

pH (meas)		
EC (meas)		dS/m
TDS (calc)		mg/L
Chloride (meas)		mg/L
Sodium (meas)		mg/L
Nitrogen (meas)		mg/L
Calcium (meas)		mg/L
Magnesium (meas)		mg/L
SAR (calc)		
Hydrocarbon, diss (meas)		mg/L

Receiving soil

As received sample

Soil density (meas)		kg/m³
Oil content (meas)		% dry wt.

Saturated paste extract

pH (meas)		
EC (meas)	#	dS/m
Chloride (meas)		mg/L
Sodium (meas)	#	mg/L
Nitrogen (meas)		mg/L
Calcium (meas)	#	mg/L
Magnesium (meas)		mg/L
SAR (calc)	#	

Mud products used	Bioassay required? (Y/N)
REQUIRED	REQUIRED
MICROTOX IF YES=>	

Microtox bioassay	Reading at 15 minutes
EC50 (15) original	>75 FOR PASS %
EC50 (15) charcoal treated	%

Notes MICROTOX REQUIRED FOR LANDSPRAY. IF ORIGINAL FAILS AND CHARCOAL PASSES, MUST TEST FOR HYDROCARBONS AS WELL.

Trace element analysis		Landspreading / Landspraying / LWD				Mix – Bury – Cover	
Analysis threshold (kg)	Conc. of analyte (mg/kg)	Minimum area (ha)	Application rate (m³/ha)	Loading rate (kg/ha)	Max. loading rate (kg/ha)	Total mass (kg)	Max. appl. quantity (kg)
B 2.5					5		10
Cd 0.75					1.5		3
Cr 50					100		200
Cu 100					200		400
Pb 50					100		200
Ni 12.5					25		50
V 50					100		200
Zn 150					300		600

Trace element analysis is only required if the amount of trace elements added to the mud exceeds the analysis threshold.

Saline / Sodic soil test results	Mix ratio ____	Mix ratio ____	Mix ratio ____
Electrical conductivity (dS/m)	NOT FOR LWD & LANDSPRAY		
Sodium adsorption ratio			

Off-site disposal location (referenced from the northeast corner of the section)

			Section	Township	Range	Meridian
Northeast corner	m South	m West	REQUIRED			W
Southwest corner	m South	m West	REQUIRED			W

COMMENTS

= MINIMUM TESTING REQUIREMENTS.

N = NITROGEN TESTING MUST BE CONDUCTED IF >400 KG ADDED.

@ = OIL CONTENT REQUIRED IF VISIBLE HYDROCARBONS, MICROTOX FAILS, HYDROCARBON ADDED, OR HORIZONTAL OIL WELL. IF ANY VISIBLE HYDROCARBONS, MAY NOT DISPOSE OF USING LWD.

RECEIVING SOIL MUST BE TESTED.

MAY NOT DISPOSE OF DRILLING WASTE USING LWD IF ANY OF THE QUESTIONS ON THE BOTTOM OF PAGE 1 ARE MARKED "YES".

MAP OF SPRAY AREA MUST BE ATTACHED AND LOCATIONS MATCH THOSE PROVIDED ABOVE.

Additional comments, disposal/treatment plan details, and site maps may be added on a separate page.

EUB Alberta Energy and Utilities Board

Notification of Drilling Waste Disposal

The licensee certifies that the information on this form is correct and is submitted to the appropriate regulatory agency 48 hours prior to drilling waste disposal.

DAY MONTH YEAR: MIX-BURY-COVER, LANDSPREAD,

YOUR FILE NUMBER: AND PUMP-OFF, PG 1 OF 2

1. REGULATORY OFFICE

Appropriate regulatory office: PROPER AGENCY AND FIELD CENTRE — Fax

Second regulatory office (if applicable): APPLICABLE IF WELL AND DISPOSAL SITE DIFF. JURISDICTION — Fax

2. WELL INFORMATION

Well licensee (COMPANY NAME): REQUIRED

Surface location (LE LSD SEC TWP RGE W M): REQUIRED — Well licence number: REQUIRED

Unique well identifier (SS LE LSD SEC TWP RGE W M P ES): REQUIRED — Mineral surface lease number (if applicable): REQUIRED IF APPLICABLE

Sump location or storage location: 1. Same as surface location / or REQUIRED IF NOT SAME AS SURFACE WELL LOCATION W__M

2. Same as surface location / or _____ W__M

Mud type: REQUIRED

Date of sampling (DAY MONTH YEAR): REQUIRED — Proposed date of disposal (48 hours notice is required) (DAY MONTH YEAR): REQUIRED

Operator/company contact (NAME): REQUIRED, MUST BE OF ACTUAL OIL AND GAS COMPANY, NOT CONTRACTOR — PHONE: REQUIRED

COMPANY NAME: REQUIRED — MOBILE — FAX

Sampling company contact (NAME): REQUIRED — PHONE: REQUIRED

COMPANY NAME: REQUIRED — MOBILE — FAX

If drilling wastes are to be disposed by land treatment or alternative disposal methods, attach the required documentation and provide a summary in Comments section on page 2.

3. ON-SITE DISPOSAL

Fluids vol ____m³ Solids vol ____m³ Total waste ____m³

Soil texture: ONE OF THE ABOVE REQUIRED TO BE COMPLETED

LANDSPREADING ☒

Application thickness: <10 cm — Incorporation depth: REQUIRED cm

Receiving soil EC: 4 OR LESS dS/m — Receiving soil SAR: 8 OR LESS

	Minimum area (ha)	Max. application rate (m³/ha)	Max. amount added (kg/ha)
Chloride	REQUIRED		
Sodium	REQUIRED		
Nitrogen	REQUIRED	IF ADDED	
TDS	REQUIRED		

Toxicity pass: Y / N / NA _____ Predicted oil content after mix: <0.1 %

Proposed application rate: MUST BE < ALL ABOVE MAXIMUM RATES m³/ha

Proposed area used for disposal: MUST BE > ALL ABOVE MINIMUM AREAS ha

MIX – BURY – COVER ☒

Estimated water table depth: >1.0 m — Intended mix ratio: 3:1 OR GREATER

Volume to be disposed: REQUIRED m³

Has site been used before? Y / N _____ Toxicity pass: Y / N / NA _____

Post-disposal values

Chloride: <2000 mg/kg — Oil: <0.1 %

Total mass chloride: <1600 kg — Total mass nitrogen: <400 kg

4. OFF-SITE DISPOSAL

Fluids vol: YES m³ Solids vol: NO m³ Total waste: NO m³

Soil texture: MUST BE FLUIDS FOR PUMP OFF Horizon thickness _____ cm

LANDSPRAYING ☐ PUMP-OFF ☒ LWD ☐

Application thickness: <10 cm — Incorporation depth: ____cm (if applicable)

Receiving soil EC: 2 OR LESS dS/m — Receiving soil SAR: 6 OR LESS

	Minimum area (ha)	Max. application rate (m³/ha)	Max. amount added (kg/ha)
Chloride	REQUIRED		
Sodium	REQUIRED		
Nitrogen	REQUIRED	IF ADDED	
TDS	REQUIRED		

Solids loading rate: LESS THAN 6 ON VEGETATED LAND t/ha

Toxicity pass: Y / N / NA: MUST BE "YES"

Predicted oil content after mix: NO HYDROCARBONS FOR PUMP OFF %

Proposed application rate: MUST BE < ALL ABOVE MAXIMUM RATES m³/ha

Proposed area used for disposal: MUST BE > MINIMUM REQUIRED AREAS ABOVE ha

Landowner: REQUIRED

Phone: REQUIRED

Date of consent: REQUIRED

Landowner consent is required if the disposal is off site.

Horizontal oil well? Y / N REQUIRED **Hydrocarbons added? Y / N** REQUIRED **Salt zone encountered? Y / N** REQUIRED **Nitrogen >400 kg added? Y / N** REQUIRED

If you answer YES to any of the above questions, please give details in the Comments section on page 2.

WELL LICENCE NO. MIX-BURY-COVER, LANDSPREAD, AND PUMP OFF PG 2 OF 2

Notification of Drilling Waste Disposal (page 2)

SS LE LSD SEC TWP RGE W M P ES

YOUR FILE NO. _____ UNIQUE WELL IDENTIFIER _____

5. DETAILED INFORMATION

Oversaturated solids, fluids, or total waste			Undersaturated solids			Clear liquids			Receiving soil		
As received sample			As received sample			As received sample			As received sample		
SG (meas)	#		SG (meas)			pH (meas)	5.5 -8.5		Soil density (meas)		kg/m³
Mud density (calc)	#	kg/m³	Mud density (calc)		kg/m³	EC (meas)	#	dS/m	Oil content (meas)		% dry wt.
DBD (calc)	#	kg/m³	DBD (calc)		kg/m³	TDS (calc)	#	mg/L			
Oil content (meas)	@	% dry wt.	Oil content (meas)		% dry wt.	Chloride (meas)	#	mg/L	Saturated paste extract		
Φ (calc)						Sodium (meas)	#	mg/L	pH (meas)		
As received filtrate			Saturated paste			Nitrogen (meas)	N	mg/L	EC (meas)	#	dS/m
pH (meas)			SG (meas)			Calcium (meas)	#	mg/L	Chloride (meas)		mg/L
EC (meas)	#	dS/m	Φ_s (calc)			Magnesium (meas)	#	mg/L	Sodium (meas)	#	mg/L
TDS (calc)	#	mg/L				SAR (calc)	#		Nitrogen (meas)		mg/L
Chloride (meas)	#	mg/L	Saturated paste extract						Calcium (meas)	#	mg/L
Sodium (meas)	#	mg/L	pH (meas)			Hydrocarbon, diss (meas)	@	mg/L	Magnesium (meas)		mg/L
Nitrogen (meas)	N	mg/L	EC (meas)		dS/m				SAR (calc)	#	
Calcium (meas)		mg/L	TDS (calc)		mg/L						
Magnesium (meas)		mg/L	Chloride (meas)		mg/L						
SAR (calc)	#		Sodium (meas)		mg/L						
			Nitrogen (meas)		mg/L						
			Calcium (meas)		mg/L						
			Magnesium (meas)		mg/L						
			SAR (calc)								

Mud products used	Bioassay required? (Y/N)
REQUIRED	REQUIRED
MICROTOX IF YES =>	

Microtax bioassay	Reading at 15 minutes
EC50 (15) original	>75 FOR PASS %
EC50 (15) charcoal treated	>75%

Notes MICROTOX REQUIRED FOR PUMP-OFF, MIX-BURY-COVER, AND LANDSPREAD IF HYDROCARBONS PRESENT OR IF TOXIC MUD COMPONENTS

Trace element analysis		Landspreading / Landspraying / LWD				Mix – Bury – Cover	
Analysis threshold (kg)	Conc. of analyte (mg/kg)	Minimum area (ha)	Application rate (m³/ha)	Loading rate (kg/ha)	Max. loading rate (kg/ha)	Total mass (kg)	Max. appl. quantity (kg)
B 2.5					5		10
Cd 0.75					1.5		3
Cr 50					100		200
Cu 100					200		400
Pb 50					100		200
Ni 12.5					25		50
V 50					100		200
Zn 150					300		600

Trace element analysis is only required if the amount of trace elements added to the mud exceeds the analysis threshold.

Saline / Sodic soil test results	Mix ratio ____	Mix ratio ____	Mix ratio ____
Electrical conductivity (dS/m)			
Sodium adsorption ratio			

Off-site disposal location (referenced from the northeast corner of the section)

			Section	Township	Range	Meridian
Northeast corner	m South	m West				W
Southwest corner	m South	m West				W

COMMENTS

# = MINIMUM TESTING REQUIREMENTS; NOTE THAT MIX-BURY-COVER DOES NOT REQUIRE EC AND SAR TESTING.
N = NITROGEN TESTING MUST BE CONDUCTED IF >400 KG ADDED.
@ = OIL CONTENT REQUIRED IF VISIBLE HYDROCARBONS, MICROTOX FAILS, HYDROCARBON ADDED, OR HORIZONTAL OIL WELL.
MAP OF DISPOSAL AREA MUST BE ATTACHED AND LOCATIONS MATCH THOSE PROVIDED ABOVE.
TESTING REQUIREMENTS FOR UNDERSATURATED SOLIDS SAME AS FOR OVERSATURATED / TOTAL WASTE.

Additional comments, disposal/treatment plan details, and site maps may be added on a separate page.

EUB Alberta Energy and Utilities Board

Notification of Drilling Waste Disposal

The licensee certifies that the information on this form is correct and is submitted to the appropriate regulatory agency 48 hours prior to drilling waste disposal.

DAY MONTH YEAR: LWD AND LANDSPRAY PG 1 OF 2

YOUR FILE NUMBER:

1. REGULATORY OFFICE

Appropriate regulatory office: PROPER AGENCY AND FIELD CENTRE — Fax:

Second regulatory office (if applicable): APPLICABLE IF WELL AND DISPOSAL SITE DIFF. JURISDICTION — Fax:

2. WELL INFORMATION

Well licensee (COMPANY NAME): REQUIRED

Surface location (LE LSD SEC TWP RGE W M): REQUIRED

Well licence number: REQUIRED

Unique well identifier (SE LE LSD SEC TWP RGE W M P ES): REQUIRED

Mineral surface lease number (if applicable): REQUIRED IF APPLICABLE

Sump location or storage location: 1. Same as surface location / or REQUIRED IF NOT SAME AS SURFACE WELL LOCATION W__M

2. Same as surface location / or _____ W__M

Mud type: REQUIRED; FOR LWD MUST BE GEL CHEM, GYPSUM WATER (FLOC), OR NITRATE GYPSUM

Date of sampling (DAY MONTH YEAR): REQUIRED

Proposed date of disposal (48 hours notice is required) (DAY MONTH YEAR): REQUIRED- LWD ACTUAL DATE IS ON POST DISPOSAL NOTIF

Operator/company contact — NAME: REQUIRED. MUST BE OF ACTUAL OIL AND GAS COMPANY, NOT CONTRACTOR — PHONE: REQUIRED

COMPANY NAME: REQUIRED — MOBILE: _____ — FAX: _____

Sampling company contact — NAME: REQUIRED — PHONE: REQUIRED

COMPANY NAME: _____ — MOBILE: _____ — FAX: _____

If drilling wastes are to be disposed by land treatment or alternative disposal methods, attach the required documentation and provide a summary in Comments section on page 2.

3. ON-SITE DISPOSAL

Fluids vol _____m³ Solids vol _____m³ Total waste _____m³

Soil texture _____

LANDSPREADING ☐

Application thickness _____cm Incorporation depth _____cm

Receiving soil EC _____dS/m Receiving soil SAR _____

	Minimum area (ha)	Max. application rate (m³/ha)	Max. amount added (kg/ha)
Chloride			
Sodium			
Nitrogen			
TDS			

Toxicity pass: Y / N / NA _____ Predicted oil content after mix _____%

Proposed application rate _____m³/ha

Proposed area used for disposal _____ha

MIX – BURY – COVER ☐

Estimated water table depth _____m Intended mix ratio _____

Volume to be disposed _____m³

Has site been used before? Y / N _____ Toxicity pass: Y / N / NA _____

Post-disposal values

Chloride _____mg/kg Oil _____%

Total mass chloride _____kg Total mass nitrogen _____kg

4. OFF-SITE DISPOSAL

Fluids vol YES m³ Solids vol NO m³ Total waste YES m³

Soil texture _____ Horizon thickness _____cm

LANDSPRAYING ☒ PUMP-OFF ☐ LWD ☒

Application thickness _____cm Incorporation depth _____cm (if applicable)

Receiving soil EC 2 OR LESS dS/m Receiving soil SAR 6 OR LESS

	Minimum area (ha)	Max. application rate (m³/ha)	Max. amount added (kg/ha)
Chloride	REQUIRED		
Sodium	REQUIRED		
Nitrogen	REQUIRED if	nitrogen added	
TDS	REQUIRED		

Solids loading rate LESS THAN 6 ON VEGETATED LAND t/ha

Toxicity pass: Y / N / NA MUST BE "Y" FOR LANDSPRAY, "NA" FOR LWD

Predicted oil content after mix <0.5% ALLOWED FOR LANDSPRAY ONLY, NOT LWD %

Proposed application rate <20 WINTER AND < 40 SUMMER m³/ha

Proposed area used for disposal MUST BE > MINIMUM REQUIRED AREAS ABOVE ha

Landowner REQUIRED

Phone REQUIRED

Date of consent REQUIRED

Landowner consent is required if the disposal is off site.

Horizontal oil well? Y / N REQUIRED Hydrocarbons added? Y / N REQUIRED Salt zone encountered? Y / N REQUIRED Nitrogen >400 kg added? Y / N REQUIRED

If you answer YES to any of the above questions, please give details in the Comments section on page 2.

WELL LICENCE NO. LWD AND LANDSPRAY PG 2 OF 2

Notification of Drilling Waste Disposal (page 2)

SS LE LSD SEC TWP RGE W M P ES

YOUR FILE NO. _____ UNIQUE WELL IDENTIFIER _____

5. DETAILED INFORMATION

Oversaturated solids, fluids, or total waste

As received sample

SG (meas)	#	
Mud density (calc)		kg/m³
DBD (calc)	#	kg/m³
Oil content (meas)	@	% dry wt.
Φ (calc)		

As received filtrate

pH (meas)		
EC (meas)	#	dS/m
TDS (calc)	#	mg/L
Chloride (meas)	#	mg/L
Sodium (meas)		mg/L
Nitrogen (meas)	N	mg/L
Calcium (meas)	#	mg/L
Magnesium (meas)		mg/L
SAR (calc)	#	

Undersaturated solids

As received sample

SG (meas)		
Mud density (calc)		kg/m³
DBD (calc)		kg/m³
Oil content (meas)		% dry wt.

Saturated paste

SG (meas)		
Φ_s (calc)		

Saturated paste extract

pH (meas)		
EC (meas)		dS/m
TDS (calc)		mg/L
Chloride (meas)		mg/L
Sodium (meas)		mg/L
Nitrogen (meas)		mg/L
Calcium (meas)		mg/L
Magnesium (meas)		mg/L
SAR (calc)		

Clear liquids

As received sample

pH (meas)		
EC (meas)		dS/m
TDS (calc)		mg/L
Chloride (meas)		mg/L
Sodium (meas)		mg/L
Nitrogen (meas)		mg/L
Calcium (meas)		mg/L
Magnesium (meas)		mg/L
SAR (calc)		
Hydrocarbon, diss (meas)		mg/L

Receiving soil

As received sample

Soil density (meas)		kg/m³
Oil content (meas)		% dry wt.

Saturated paste extract

pH (meas)		
EC (meas)	#	dS/m
Chloride (meas)		mg/L
Sodium (meas)	#	mg/L
Nitrogen (meas)		mg/L
Calcium (meas)	#	mg/L
Magnesium (meas)		mg/L
SAR (calc)	#	

Mud products used	Bioassay required? (Y/N)
REQUIRED	REQUIRED
MICROTOX IF YES=>	

Microtox bioassay	Reading at 15 minutes
EC50 (15) original	>75 FOR PASS %
EC50 (15) charcoal treated	%

Notes MICROTOX REQUIRED FOR LANDSPRAY. IF ORIGINAL FAILS AND CHARCOAL PASSES, MUST TEST FOR HYDROCARBONS AS WELL.

Trace element analysis		Landspreading / Landspraying / LWD				Mix – Bury – Cover	
Analysis threshold (kg)	Conc. of analyte (mg/kg)	Minimum area (ha)	Application rate (m³/ha)	Loading rate (kg/ha)	Max. loading rate (kg/ha)	Total mass (kg)	Max. appl. quantity (kg)
B 2.5					5		10
Cd 0.75					1.5		3
Cr 50					100		200
Cu 100					200		400
Pb 50					100		200
Ni 12.5					25		50
V 50					100		200
Zn 150					300		600

Trace element analysis is only required if the amount of trace elements added to the mud exceeds the analysis threshold.

Saline / Sodic soil test results	Mix ratio ____	Mix ratio ____	Mix ratio ____
Electrical conductivity (dS/m)	NOT FOR LWD & LANDSPRAY		
Sodium adsorption ratio			

Off-site disposal location (referenced from the northeast corner of the section)

			Section	Township	Range	Meridian
Northeast corner	m South	m West	REQUIRED			W
Southwest corner	m South	m West	REQUIRED			W

COMMENTS

= MINIMUM TESTING REQUIREMENTS.

N = NITROGEN TESTING MUST BE CONDUCTED IF >400 KG ADDED.

@ = OIL CONTENT REQUIRED IF VISIBLE HYDROCARBONS, MICROTOX FAILS, HYDROCARBON ADDED, OR HORIZONTAL OIL WELL. IF ANY VISIBLE HYDROCARBONS, MAY NOT DISPOSE OF USING LWD.

RECEIVING SOIL MUST BE TESTED.

MAY NOT DISPOSE OF DRILLING WASTE USING LWD IF ANY OF THE QUESTIONS ON THE BOTTOM OF PAGE 1 ARE MARKED "YES".

MAP OF SPRAY AREA MUST BE ATTACHED AND LOCATIONS MATCH THOSE PROVIDED ABOVE.

Additional comments, disposal/treatment plan details, and site maps may be added on a separate page.

EUB Alberta Energy and Utilities Board

Notification of Drilling Waste Disposal

The licensee certifies that the information on this form is correct and is submitted to the appropriate regulatory agency 48 hours prior to drilling waste disposal.

DAY MONTH YEAR: MIX-BURY-COVER, LANDSPREAD,

YOUR FILE NUMBER: AND PUMP-OFF, PG 1 OF 2

1. REGULATORY OFFICE

Appropriate regulatory office: PROPER AGENCY AND FIELD CENTRE — Fax

Second regulatory office (if applicable): APPLICABLE IF WELL AND DISPOSAL SITE DIFF. JURISDICTION — Fax

2. WELL INFORMATION

Well licensee: COMPANY NAME REQUIRED

Surface location: LE LSD SEC TWP RGE W M — REQUIRED

Well licence number: REQUIRED

Unique well identifier: SS LE LSD SEC TWP RGE W M P ES — REQUIRED

Mineral surface lease number (if applicable): REQUIRED IF APPLICABLE

Sump location or storage location: 1. Same as surface location / or REQUIRED IF NOT SAME AS SURFACE WELL LOCATION W___M

2. Same as surface location / or _____ W___M

Mud type: REQUIRED

Date of sampling: DAY MONTH YEAR — REQUIRED

Proposed date of disposal (48 hours notice is required): DAY MONTH YEAR — REQUIRED

Operator/company contact: NAME REQUIRED, MUST BE OF ACTUAL OIL AND GAS COMPANY, NOT CONTRACTOR; PHONE REQUIRED; COMPANY NAME REQUIRED; MOBILE; FAX

Sampling company contact: NAME REQUIRED; PHONE REQUIRED; COMPANY NAME REQUIRED; MOBILE; FAX

If drilling wastes are to be disposed by land treatment or alternative disposal methods, attach the required documentation and provide a summary in Comments section on page 2.

3. ON-SITE DISPOSAL

Fluids vol ____m³ Solids vol ____m³ Total waste ____m³

Soil texture ONE OF THE ABOVE REQUIRED TO BE COMPLETED

LANDSPREADING ☒

Application thickness <10 cm — Incorporation depth REQUIRED cm

Receiving soil EC 4 OR LESS dS/m — Receiving soil SAR 8 OR LESS

	Minimum area (ha)	Max. application rate (m³/ha)	Max. amount added (kg/ha)
Chloride	REQUIRED		
Sodium	REQUIRED		
Nitrogen	REQUIRED	IF ADDED	
TDS	REQUIRED		

Toxicity pass: Y / N / NA _____ Predicted oil content after mix <0.1 %

Proposed application rate MUST BE < ALL ABOVE MAXIMUM RATES m³/ha

Proposed area used for disposal MUST BE > ALL ABOVE MINIMUM AREAS ha

MIX – BURY – COVER ☒

Estimated water table depth >1.0 m — Intended mix ratio 3:1 OR GREATER

Volume to be disposed REQUIRED m³

Has site been used before? Y / N _____ Toxicity pass: Y / N / NA _____

Post-disposal values

Chloride <2000 mg/kg — Oil <0.1 %

Total mass chloride <1600 kg — Total mass nitrogen <400 kg

4. OFF-SITE DISPOSAL

Fluids vol YES m³ Solids vol NO m³ Total waste NO m³

Soil texture MUST BE FLUIDS FOR PUMP OFF Horizon thickness _____ cm

LANDSPRAYING ☐ PUMP-OFF ☒ LWD ☐

Application thickness <10 cm — Incorporation depth ____cm (If applicable)

Receiving soil EC 2 OR LESS dS/m — Receiving soil SAR 6 OR LESS

	Minimum area (ha)	Max. application rate (m³/ha)	Max. amount added (kg/ha)
Chloride	REQUIRED		
Sodium	REQUIRED		
Nitrogen	REQUIRED	IF ADDED	
TDS	REQUIRED		

Solids loading rate LESS THAN 6 ON VEGETATED LAND t/ha

Toxicity pass: Y / N / NA MUST BE "YES"

Predicted oil content after mix NO HYDROCARBONS FOR PUMP OFF %

Proposed application rate MUST BE < ALL ABOVE MAXIMUM RATES m³/ha

Proposed area used for disposal MUST BE > MINIMUM REQUIRED AREAS ABOVE ha

Landowner REQUIRED

Phone REQUIRED

Date of consent REQUIRED

Landowner consent is required if the disposal is off site.

Horizontal oil well? Y / N REQUIRED — Hydrocarbons added? Y / N REQUIRED — Salt zone encountered? Y / N REQUIRED — Nitrogen >400 kg added? Y / N REQUIRED

If you answer YES to any of the above questions, please give details in the Comments section on page 2.

WELL LICENCE NO. MIX-BURY-COVER, LANDSPREAD, AND PUMP OFF PG 2 OF 2

Notification of Drilling Waste Disposal (page 2)

SS LE LSD SEC TWP RGE W M P ES

YOUR FILE NO. _____ UNIQUE WELL IDENTIFIER _____

5. DETAILED INFORMATION

Oversaturated solids, fluids, or total waste

As received sample

SG (meas)	#	
Mud density (calc)	#	kg/m³
DBD (calc)	#	kg/m³
Oil content (meas)	@	% dry wt.
Φ (calc)		

As received filtrate

pH (meas)		
EC (meas)	#	dS/m
TDS (calc)	#	mg/L
Chloride (meas)	#	mg/L
Sodium (meas)	#	mg/L
Nitrogen (meas)	N	mg/L
Calcium (meas)		mg/L
Magnesium (meas)		mg/L
SAR (calc)	#	

Undersaturated solids

As received sample

SG (meas)		
Mud density (calc)		kg/m³
DBD (calc)		kg/m³
Oil content (meas)		% dry wt.

Saturated paste

SG (meas)		
Φ_s (calc)		

Saturated paste extract

pH (meas)		
EC (meas)		dS/m
TDS (calc)		mg/L
Chloride (meas)		mg/L
Sodium (meas)		mg/L
Nitrogen (meas)		mg/L
Calcium (meas)		mg/L
Magnesium (meas)		mg/L
SAR (calc)		

Clear liquids

As received sample

pH (meas)	5.5 -8.5	
EC (meas)	#	dS/m
TDS (calc)	#	mg/L
Chloride (meas)	#	mg/L
Sodium (meas)	#	mg/L
Nitrogen (meas)	N	mg/L
Calcium (meas)	#	mg/L
Magnesium (meas)	#	mg/L
SAR (calc)	#	
Hydrocarbon, diss (meas)	@	mg/L

Receiving soil

As received sample

Soil density (meas)		kg/m³
Oil content (meas)		% dry wt.

Saturated paste extract

pH (meas)		
EC (meas)	#	dS/m
Chloride (meas)		mg/L
Sodium (meas)	#	mg/L
Nitrogen (meas)		mg/L
Calcium (meas)	#	mg/L
Magnesium (meas)		mg/L
SAR (calc)	#	

Mud products used	Bioassay required? (Y/N)
REQUIRED	REQUIRED
MICROTOX IF YES =>	

Microtax bioassay	Reading at 15 minutes
EC50 (15) original	>75 FOR PASS %
EC50 (15) charcoal treated	>75%

Notes MICROTOX REQUIRED FOR PUMP-OFF, MIX-BURY-COVER, AND LANDSPREAD IF HYDROCARBONS PRESENT OR IF TOXIC MUD COMPONENTS

Trace element analysis		Landspreading / Landspraying / LWD				Mix – Bury – Cover	
Analysis threshold (kg)	Conc. of analyte (mg/kg)	Minimum area (ha)	Application rate (m³/ha)	Loading rate (kg/ha)	Max. loading rate (kg/ha)	Total mass (kg)	Max. appl. quantity (kg)
B 2.5					5		10
Cd 0.75					1.5		3
Cr 50					100		200
Cu 100					200		400
Pb 50					100		200
Ni 12.5					25		50
V 50					100		200
Zn 150					300		600

Trace element analysis is only required if the amount of trace elements added to the mud exceeds the analysis threshold.

Saline / Sodic soil test results	Mix ratio ____	Mix ratio ____	Mix ratio ____
Electrical conductivity (dS/m)			
Sodium adsorption ratio			

Off-site disposal location (referenced from the northeast corner of the section)

			Section	Township	Range	Meridian
Northeast corner	m South	m West				W
Southwest corner	m South	m West				W

COMMENTS

# = MINIMUM TESTING REQUIREMENTS; NOTE THAT MIX-BURY-COVER DOES NOT REQUIRE EC AND SAR TESTING.
N = NITROGEN TESTING MUST BE CONDUCTED IF >400 KG ADDED.
@ = OIL CONTENT REQUIRED IF VISIBLE HYDROCARBONS, MICROTOX FAILS, HYDROCARBON ADDED, OR HORIZONTAL OIL WELL.
MAP OF DISPOSAL AREA MUST BE ATTACHED AND LOCATIONS MATCH THOSE PROVIDED ABOVE.
TESTING REQUIREMENTS FOR UNDERSATURATED SOLIDS SAME AS FOR OVERSATURATED / TOTAL WASTE.

Additional comments, disposal/treatment plan details, and site maps may be added on a separate page.

Appendix 3 Enforcement and Compliance Regarding Waste Audits and Inspections

Drilling waste disposal inspections and audits evaluate drilling waste disposal management practices, such as notification requirements and disposal options, to ensure safe and environmentally sound drilling waste disposals and to ensure compliance with applicable EUB requirements, including those in *Guide 50*.

Routine and nonroutine drilling waste disposals are managed in accordance with the EUB's enforcement ladders, outlined in *IL 99-4: EUB Field Surveillance Enforcement Process and Ladder* (Appendix 1). Upon audit or inspection, failure to meet the *Guide 50* requirements is considered a noncompliance event, which may result in enforcement actions.

Noncompliance Items

Noncompliance items identified in drilling waste audits and inspections are defined as minor, major, or serious and are subject to the Field Surveillance enforcement process outlined in *IL 99-4*.

IL 99-4 contains appropriate enforcement actions for each level within the minor, major, or serious ladders. Examples of enforcement actions resulting from initial noncompliance activities are listed below for each ladder. These enforcement actions will escalate to higher enforcement levels within each ladder, as per *IL 99-4*, if

- the initial noncompliance (minor, major, serious) is not remedied in accordance with EUB instructions, or
- a second noncompliance (major or serious ladder only) in drilling waste management is recorded provincewide after a prescribed time period (e.g., 30 days if using the major ladder).

See *IL 99-4* for detailed descriptions of enforcement levels, enforcement actions, and conditions for enforcement level escalation.

Minor (Level-1) Noncompliance Enforcement Ladder

Definition

A minor noncompliance is an initial unaddressed noncompliance item that does not create an adverse effect on public safety and/or the environment, does not create a financial liability to the EUB, and is not indicative of a broad corporate deficiency.

Noncompliance Examples

- Minor information deficiencies on the Notification of Drilling Waste Disposal form
- Insufficient records to verify that waste was appropriately analyzed as per *Guide 50* disposal criteria, but impacts expected to be minor
- Insufficient testing to characterize the waste, but impacts expected to be minor
- Inaccurate disposal option reported, but disposition verified to be appropriate

- Insufficient records to verify that the disposal option criteria were achieved
- Not all disposal option criteria achieved, but impacts expected to be minor
- Audit and/or additionally requested inspection information not submitted by required deadline

Enforcement Action Examples

- Well licensee is instructed to take corrective action to remedy the noncompliance; confirmation may be requested if necessary.
- Well licensee is instructed to adjust drilling waste disposal management practices to ensure the noncompliance is not repeated; confirmation is not requested.

Major (Level-2) Noncompliance Enforcement Ladder

Definition

A major noncompliance is an initial unaddressed noncompliance item that creates an immediate or potential adverse effect on public safety and/or the environment, creates an immediate or potential financial liability to the EUB, and is indicative of a broad corporate deficiency.

Noncompliance Examples

- Insufficient testing to appropriately characterize the waste; impacts expected to be major
- Not all disposal option criteria achieved; impacts expected to be major
- Disposal option (e.g., location or method) verified to be inappropriate or not approved to accept the waste stream

Enforcement Action Examples

- Senior well licensee representative with provincial authority is instructed to take corrective action to remedy the identified noncompliance and ensure provincewide compliance; written confirmation is required; a meeting with the company may be required.
- Temporary suspension of certain drilling waste management operations or facility components may be required to alleviate impact or protect potential impact until the noncompliance is corrected.
- Company must submit an action plan in writing to ensure the noncompliance issue does not recur.
- Company must provide a written explanation of why event occurred.

Serious (Level-3) Noncompliance Enforcement Ladder

Definition

A serious noncompliance is an initial unaddressed major noncompliance combined with demonstrated disregard for the regulation(s)/requirement(s) or fraudulent activities.

Noncompliance Examples

- Knowingly not sufficiently characterizing the waste, understanding that the impacts will be major
- Knowingly reporting an inaccurate disposal option to conceal using an inappropriate disposition site
- Knowingly not meeting all disposal option criteria, understanding that the impacts will be major
- Knowingly using an inappropriate disposal option or one not approved to accept the waste stream

Enforcement Action Examples

- Senior company representative with provincial authority is instructed to take corrective actions to remedy the identified noncompliance and ensure provincewide compliance; written confirmation is required to confirm that compliance.
- Full or partial suspension of the deficient waste management operations or facility components are required to alleviate impact or potential impact.
- Company must submit in writing an explanation of why the noncompliance occurred and an action plan, which may include a third-party assessment, to ensure the noncompliance issue does not recur. This must be presented at a meeting with EUB staff.
- The noncompliance event is added to the EUB Corporate Data Information System (CDIS) for 12 months.
- Senior well licensee representatives (vice-president or president) must meet with EUB representatives to discuss the noncompliance occurrence, the corrective actions to remedy the noncompliance, the action plan to prevent future occurrence, and the consequences of continued or repeated noncompliance.
- Note that the suspension is not rescinded until the EUB issues a written approval to resume operations and the well licensee completes all enforcement requirements to the satisfaction of the EUB. The well licensee must submit in a written submission confirmation that the corrective action is remedied, an explanation of the noncompliance cause and action plan to prevent future occurrence, and confirmation that a meeting between senior company representatives and the EUB has occurred.

The EUB reserves the right to escalate noncompliance issues to any level should conditions warrant.

Appendix 4 Audit Referrals

Drilling well licensees are subject to audits conducted by the EUB Operations Group in Calgary.

Request for Field Inspection as Part of Audit (from Operations Group)

The Operations Group may request that a site evaluation be completed as part of the audit program. Operations Group staff then send the Drilling Waste Audit Field Data Request form (see next page) to the appropriate Field Centre. The form identifies the areas of concern and what needs to be inspected. The field inspection for audit is conducted using the same parameters as a routine field inspection, unless otherwise directed.

Request for Audit to Be Conducted (from Field Centre)

An audit may be recommended by the Field Centre and conducted by the Operations Group in Calgary if any of the following conditions apply:

- Repeated noncompliance with *Guide 50* requirements
- Well licensee uncooperative or unresponsive to requests from field staff
- Inspection of disposal practice indicates that there may be a provincewide problem

The field inspector should not make a field referral for an audit until a field inspection is complete and the inspector has followed the established course of enforcement action. When making a referral, the field inspector should send copies of the following to the Operations Group:

- Audit Referral form (see page 67)
- Relevant information received from the well licensee
- Inspection information, including inspection results, well licensee correspondence, and enforcement action taken to date
- Reasons for the audit request
- History of well licensee performance, including any previous problems

EUB Alberta Energy and Utilities Board

Drilling Waste Audit
Field Data Request

Date _____ Field Centre _____ Please return by _____

Requested by _____

Attachments:
- ☐ Notification form _____
- ☐ Disposal maps _____
- ☐ Well file _____

Bottomhole location _____
Surface location _____
Disposal location _____
Disposal type _____

Check the disposal location for problems regarding

- ☐ Overapplication
- ☐ Sloughing
- ☐ Poor vegetation growth
- ☐ Runoff problems
- ☐ Cultivation
- ☐ Other (explain) _____
- ☐ Hydrocarbon odours/liquids
- ☐ Correct location of disposal
- ☐ Land use
- ☐ Solids in pump-off area
- ☐ Ground or surface water concerns

Findings: _____

Inspector's name _____ Signature _____ Date _____

Alberta Energy and Utilities Board 640 - 5 Avenue SW Calgary, Alberta Canada T2P 3G4

EUB Alberta Energy and Utilities Board

Audit Referral Form

Field Centre _____

Inspector Name _____

Company Name _____

Company Contact _____

Phone Number _____

Date _____

Phone No. _____

Location(s) previously found unsatisfactory	Reason unsatisfactory	Company response (satisfactory/unsatisfactory)
__/ __ _ __ __W __		
__/ __ _ __ __W __		
__/ __ _ __ __W __		
__/ __ _ __ __W __		
__/ __ _ __ __W __		
__/ __ _ __ __W __		
__/ __ _ __ __W __		
__/ __ _ __ __W __		

Comments _____

Be sure to attach completed inspection forms for each location noted above. Include any additional information collected during previous inspections.